JLG® GRADALL®

OWNER/OPERATOR MANUAL

GRADALL®

G6-42A

9147-4003

June 2003

Starting Serial No.
0190001 thru 0190457
& 0160000022 thru Current

Form #20036

Original Issue 3/01
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G6-42A MATERIAL HANDLER OWNER/OPERATOR MANUAL

COVERING OPERATION & PERIODIC MAINTENANCE

GRADALL®

material handler

IMPORTANT!

Read and understand this Manual and the Gradall Material Handler Safety Manual before starting, operating or performing maintenance procedures on this machine.

KEEP OPERATOR AND SAFETY MANUALS IN CAB

A JLG Company

Form No. 20036

COVERS MATERIAL HANDLER G6-42A
STARTING SERIAL NUMBER
0190001 thru 0190457 & 0160000022 thru Current

JLG®

Part No. 9147-4003
Revised 6-13-03

IMPORTANT SAFETY NOTICE

Safe operation depends on reliable equipment and proper operating procedures. Performing the checks and services described in this Manual will help keep your GRADALL Material Handler in reliable condition. Following recommended operating procedures can help you avoid accidents. Because some procedures may be new to even the experienced operator, we require that this Manual be read, understood and complied with by all who operate this machine.

Strict attention to and compliance with instructions provided in this Manual, the GRADALL Material Handler Safety Manual, as well as instructional decals and plates affixed to the machine will help prevent injuries to personnel and damage to the equipment. The information provided herein is not intended to cover all situations; it is impossible to anticipate and evaluate all possible applications and methods of operation for this equipment.

This Manual covers recommended operating procedures and basic maintenance checks and services for the Material Handler. Detailed maintenance information is available in the appropriate Service Manual.

Any procedure not specifically recommended by GRADALL must be thoroughly evaluated from the standpoint of safety before it is placed in practice. If you are not sure, contact your GRADALL Material Handler Distributor before operating.

Use only GRADALL authorized parts. The use of counterfeit parts may cause premature failure which could lead to injuries and/or machine damage.

Do not modify this machine without written permission from GRADALL. Use only genuine GRADALL replacement parts.

OTHER NOTICES

GRADALL retains all proprietary rights to the information contained in this Manual.

GRADALL reserves the right to change specifications without notice.

Gradall is a registered trademark for Hydraulic Excavators, Hydraulic Material Handlers and Attachments manufactured by The Gradall Company.

REVISIONS

This page is provided so you may determine that this Manual is complete and current with respect to Gradall Engineering Specifications.

Page	Date	Revision
17.1	7-22-02	Added an additional lubrication notice.
Cover	6-13-03	Revised Notes & Serial Numbers.
Intro		Revised Operator Qualification section.
2.0		Revised all.
2.1		Revised all.
2.2		Replaced 9140-3525 Decal with 9150-3102 Decal.
2.3		Replaced 9147-3123 Decal with 9147-3217 Decal; added 9141-3061 Decal &
		P/N's to Angus Palm Decal.
2.4		Revised locations on 9108-3492, 9114-3288, 9114-3284, 9114-3281 &
		9114-3285 Decals.
2.5		Revised location on 9114-3282 Decal.
3.0		Revised Operator's Cab section & Figure 3-1.
3.1		Revised Warning.
3.2		Revised Service Brake description.
6.0		Revised Cold-Weather Starting Aid section.
7.0		Revised Service Brake section.
8.0		Revised Precaution & Parking Procedure sections.
12.2		Revised Load Center section; Removed Figure.
12.3		Changed Figure 12-5 to 12-4.
12.4		Changed Figure 12-6 to 12-5.
13.1		Revised Attachment Operation section.
13.8		Revised Personnel Work Platform section.
14.0		Revised Step 4; Added Figure 14-1.
16.0		Revised Moving Short Distances section.
16.1		Added Carraro Axle to title; changed all chock references to block.
16.2		Added Page for Dana Axle.
17.0		Added Figure 17-1.
17.1		Revised Art.
17.3		Changed Carraro Axle Values & Added Dana Axle Values.

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General

This Manual provides important information regarding safe operating and maintenance requirements for GRADALL Material Handlers. Refer to front cover for specific model and serial number range.

If you have any questions regarding the material handler, contact your GRADALL Material Handler Distributor.

Operator Qualifications

Operators of the material handler must be in good physical and mental condition, have normal reflexes and reaction time, good vision and depth perception and normal hearing. He must not be using medication which could impair abilities nor be under the influence of alcohol or any other intoxicant during the work shift.

The operator should possess a valid, applicable driver's license and must have completed a training course for this type of material handling equipment.

In addition, the operator must read/view, understand and comply with instructions contained in the following material furnished with the material handler:

- This Owner/Operator Manual
- GRADALL Material Handler Safety Manual
- All instructional decals and plates
- Any optional equipment instructions furnished

The operator must also read, understand and comply with all applicable Employer, Industry and Governmental rules, standards and regulations.

Orientation

When used to describe the location of components in the material handler, the directions "front'", "rear", "right" and "left" relate to the orientation of a person sitting in the operator's seat. **(See figure I-1)**

Related Manuals & Decals

Separate publications are furnished with the material handler to provide information concerning safety, replacement parts, maintenance procedures, theory of operation and vendor components. Replacement manuals, decals and instruction plates can be ordered from your GRADALL Material Handler Distributor.

Models Covered

This Manual covers basic information for Gradall Material Handlers. Detailed information for each particular machine is in the maintenance section in the back of this manual. Be certain to refer to proper information for your unit and the optional equipment furnished on your machine.

Serial Number Location

Specify Model Number and Serial Number when ordering parts and when discussing specific applications and procedures with your Distributor. The model/serial number plate is located inside the operator's cab, right wall.
(See figure I-2)

NOTE!

"Material handler" and handler are used interchangeably throughout this Manual.

NOTE!

Though no offense or discrimination is intended, only the masculine pronouns will be used throughout the remainder of this Manual.

NOTE!

In the U.S.A., the operator must have completed a training course meeting the OSHA Powered Industrial Truck Operator Training Requirements (CFR 1910.178)

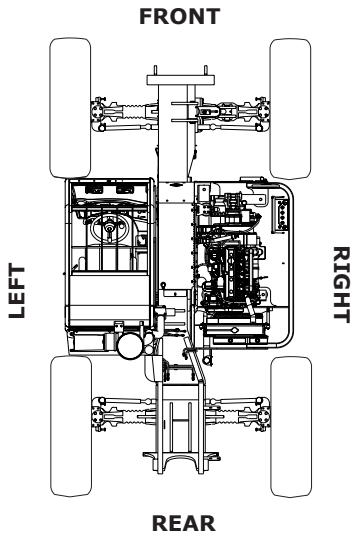


Figure I-1

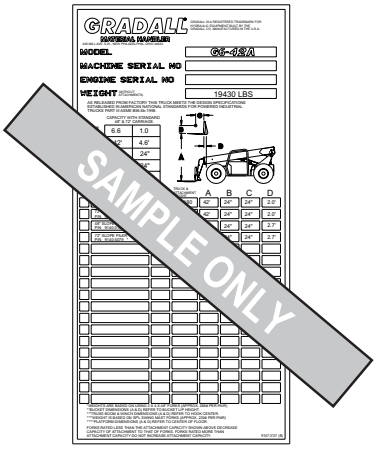


Figure I-2

SAFETY HIGHLIGHTS

Read and understand all manuals and instructional material listed on cover, inside front cover and introduction page of this Manual before starting, operating or performing maintenance procedures on this equipment.

Regardless of previous experience operating similar equipment, the operator must be given sufficient opportunity to practice with the handler in a safe, open area (not hazardous to people or property) to gain operating skills and the proper "feel" for controls and operating clearances required for safe, efficient operation.

GRADALL Material Handlers are equipped with a right-side rearview mirror. This mirror is intended as an operator's aid and does not replace the requirement for line-of-sight. Certain job site and machine conditions may require use of a signal person to help the operator when picking, placing or transporting a load. Never operate the handler until you know pick-up point, line of travel and landing point are clear. Always be aware that objects in mirror are closer than they appear.

Safety Precautions

Make sure all **DANGER, WARNING, CAUTION and INSTRUCTIONAL DECALS** are in place and can be read. Clean or replace decals as required.

Ensure handler is on a firm, level surface before lifting or placing load. Have surface leveled if necessary. **Unit can tip over if load is raised with handler on a soft or uneven surface.**

When traveling at high rates of speed, use two wheel front steer mode and **slow the machine prior to turning.**

Do not change steer mode while the machine is traveling. Change the steer mode only when machine is stopped.

Always look in the direction of travel. **Reduce speed and be especially careful when traveling in reverse and/or turning.** Bring the machine to a complete stop before changing the direction of travel.

Travel in reverse only at slow rates of speed.

When turning, the forks on the four wheel steer machine sweep through an arc beyond the turn radius of the tires. **Maintain adequate clearance between the forks/load and other objects.**

If load or conditions obstruct view, **use a signal person** when lifting, carrying or placing a load.

Loose clothing can get caught in moving machinery and can also cause accidental actuation of controls. **Dress properly for the job.**

Be alert to any unusual response to controls. If unusual response is noticed, position handler in a safe area, lower forks to ground, apply parking brake, stop engine and remove key from ignition switch. Tag steering wheel to forbid operation and **notify maintenance personnel.**

Keep hands, gloves, shoes, control knobs and pedals clean. **Slippery controls can cause accidents.** Keep a firm grip on the steering wheel when traveling.

Load capacities are based on load center being within .6m (24 inches) from front vertical face of forks.

WATCH FOR THESE SYMBOLS ; THEY CALL YOUR ATTENTION TO SAFETY NOTICES.

⚠ DANGER

This symbol indicates an extreme hazard which will result in high probability of death or serious injury if proper precautions are not taken.

⚠ WARNING

This symbol indicates a hazard which could result in death or serious injury if proper precautions are not taken.

⚠ CAUTION

This symbol indicates a hazard which may result in injury or damage to equipment or property if proper precautions are not taken.

⚠ WARNING

Operator must be seated with seat belt fastened, transmission control lever in "Neutral" position, parking brake applied and all hydraulic controls in "Neutral" before starting engine.

Release trapped pressure before disconnecting, opening or removing any hydraulic component.

Keep all windows and mirror(s) clean. Adjust mirror(s) as required for maximum visibility, before and during operation.

Do not increase engine speed with the transmission in forward or reverse and the service brake pedal depressed in an attempt to get quicker hydraulic performance. This could cause unexpected machine movement.

After bringing the material handler to a stop using the service brake, place the directional control lever in neutral, and set the park brake prior to lifting a load.

Allow the handler to slow down, or use the service brakes prior to down-shifting. **Do not downshift more than one gear at a time.**

When traveling on downhill slopes, downshift to a lower gear and use the service brake as necessary to maintain a slow speed. **Do not shift into neutral and coast downhill.**

Never permit diesel engine to run out of fuel. Doing so can cause severe engine damage.

DO NOT burn or drill holes in forks. Modifying any part of machine or attachment affects it's capacity and/or stability of machine.

Keep head, arms, hands, legs and all other body parts inside the operator's cab at all times.

DO NOT approach power lines, overhead or underground cables or other power sources with any part of your material handler or load unless all local, state/provincial and federal regulations have been met and the appropriate utility company's hotline has been contacted to de-energize the lines.

Whenever leaving the cab, perform standard shut-down procedure:

Standard Shut-Down Procedure

Position the handler in a safe location, lower forks to ground, apply park brake, move all controls to "Neutral", allow engine to run at low idle for 3 to 5 minutes. Stop engine and remove ignition key. Chock wheels.

BATTERIES
AND RELATED PARTS
CONTAIN LEAD
WASH HANDS
AFTER HANDLING!
WARNING: Battery posts, terminal and related accessories contain lead and lead compounds, chemicals known to the State of California to cause cancer and reproductive harm.

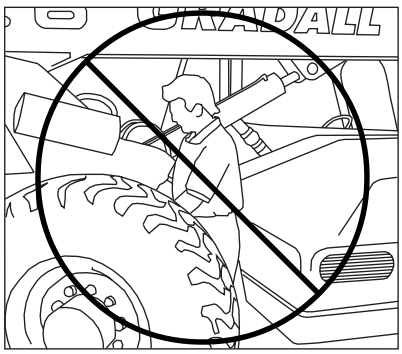
CALIFORNIA PROPOSITION 65
BATTERY WARNING
Battery posts, terminals and related accessories contain lead and lead compounds, chemicals known to the State of California to cause cancer and reproductive harm.
WASH HANDS
AFTER HANDLING !

WARNING

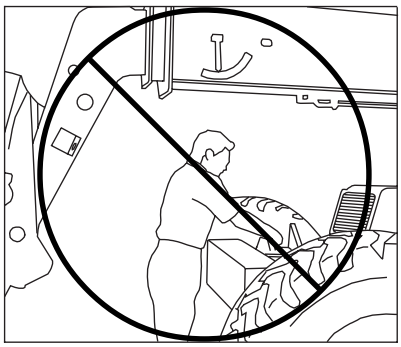
Contact The Gradall Company prior to welding on machine.

Pinch Points

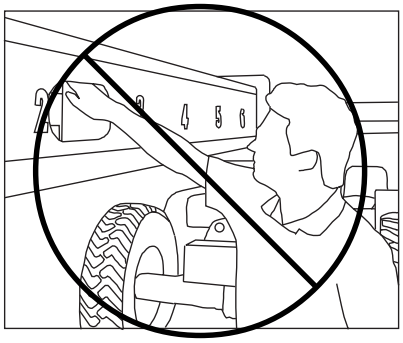
Stay clear of pinch points and rotating parts on the material handler. Getting caught in a pinch point or a moving part can cause serious injury or death. Before performing any maintenance on machine, follow the "STANDARD SHUT-DOWN PROCEDURE" on page 1.1.



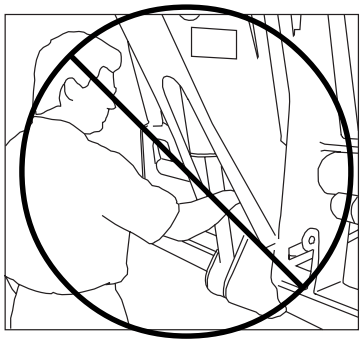
Front & Rear Steering Axles



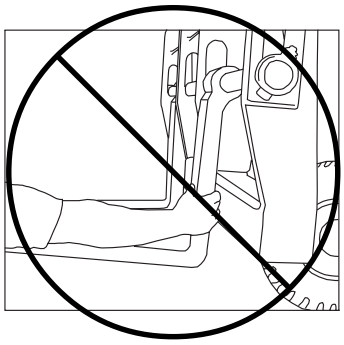
Boom



Boom Holes



Attachment Tilt Cylinder



Carriage Forks

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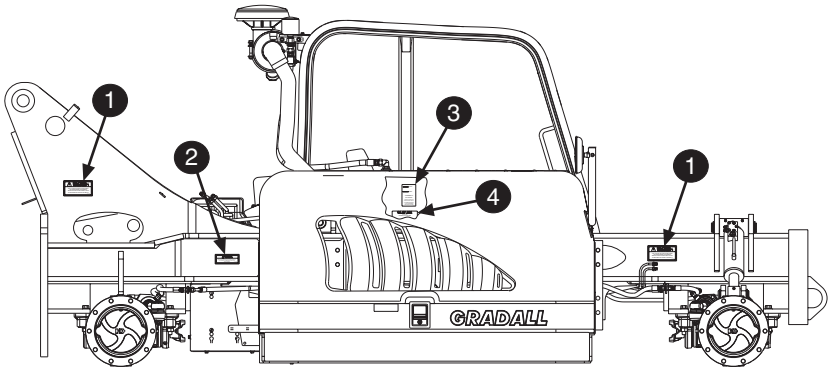
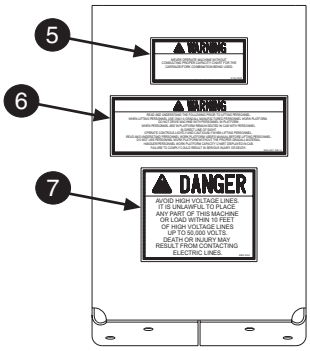
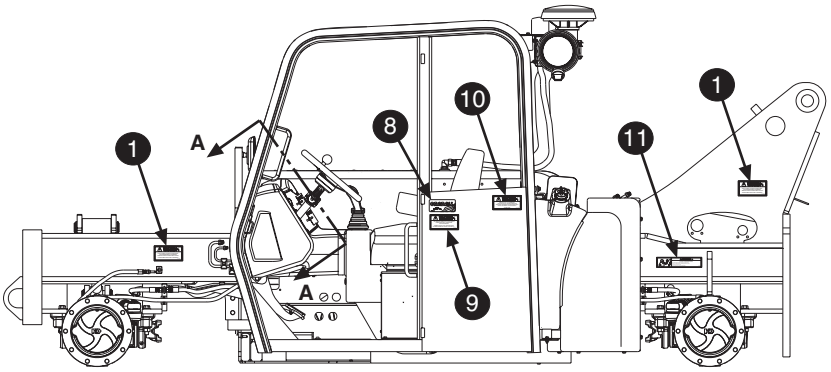
DECAL LOCATIONS

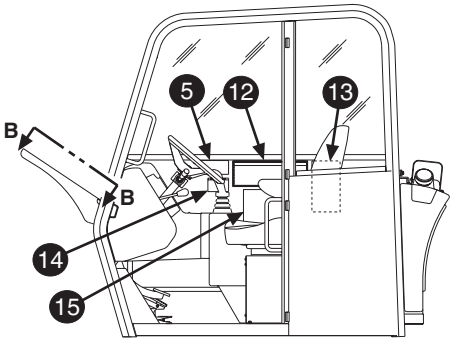
Figure 2-1

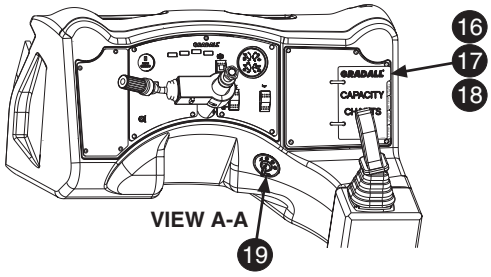




VIEW B-B



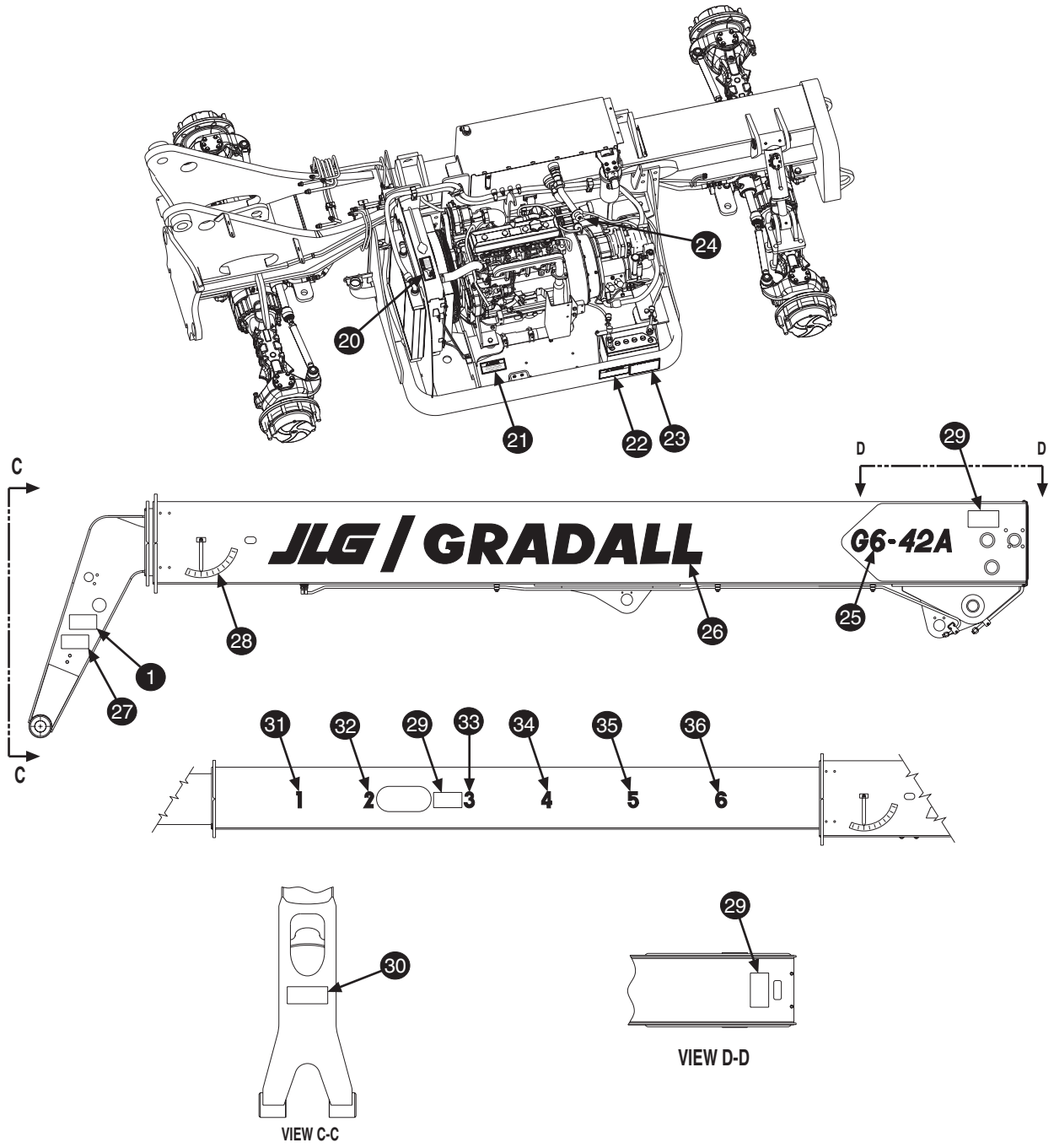




VIEW A-A

1	9114-3282	Warning Decal, Pinch Point	11	9108-3492	Oil Warning Decal
2	9114-3280	Warning Decal, Exhaust System	12	9055-3028	Warning Decal, Safe Operation
3	9140-3569	Oil Level Decal	13	9147-3131	Serial No. & Attaching Plate
4	9114-3288	Hydraulic Oil Decal	14	9150-3102	Boom Operation Decal
5	9132-3030	Warning Decal, Capacity Chart	15	9147-3217	Service Instruction Plate
6	9055-3027	Warning Decal, Lifting Personnel	16	9140-3618	Load Chart Cover
7	8060-3022	Danger Decal, High Voltage	17	9147-3139	Carriage Chart
8	7733-3027	Made in USA Decal	18	9147-3162	G6-42A Capacity Chart
9	9114-3283	Warning Decal, No Riders	19	9141-3061	Ignition Decal, (S/N 0160001283 thru Current)
10	9114-3286	Warning Decal, Diesel Fuel			

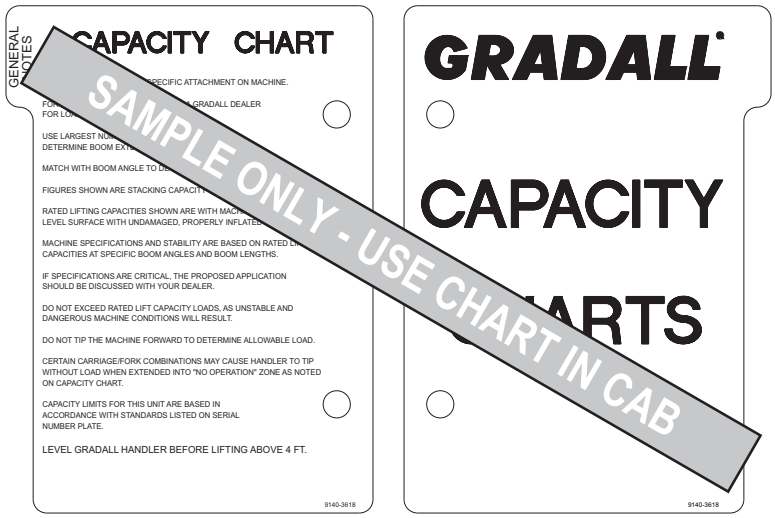
Figure 2-2



20	8060-3026	Caution Decal, Cooling System
21	9114-3281	Warning Decal, Moving Parts
22	9114-3284	Warning Decal, Battery
23	9114-3285	Instruction Decal, Jump Start
24	9140-3573	Hydraulic Fluid Decal
25	9147-3133	G6-42A Decal
26	9147-3132	Gradall Decal
27	9114-3290	Warning Decal, Attachment
28	9100-3031	Boom Angle Decal

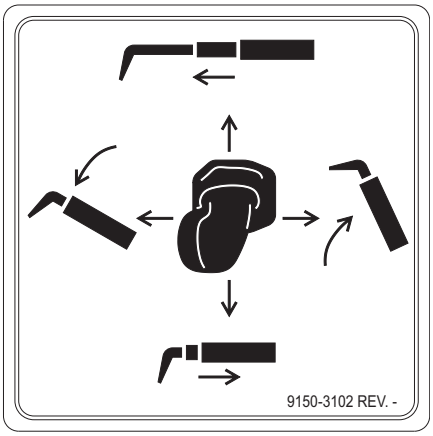
29	8060-3037	Warning Decal, Pinch Point
30	9055-3026	Warning Decal, Lifting Personnel
31	9100-3016	“1” Decal
32	9100-3018	“2” Decal
33	9112-3042	“3” Decal
34	9100-3020	“4” Decal
35	9112-3044	“5” Decal
36	9116-3077	“6” Decal

DECALS

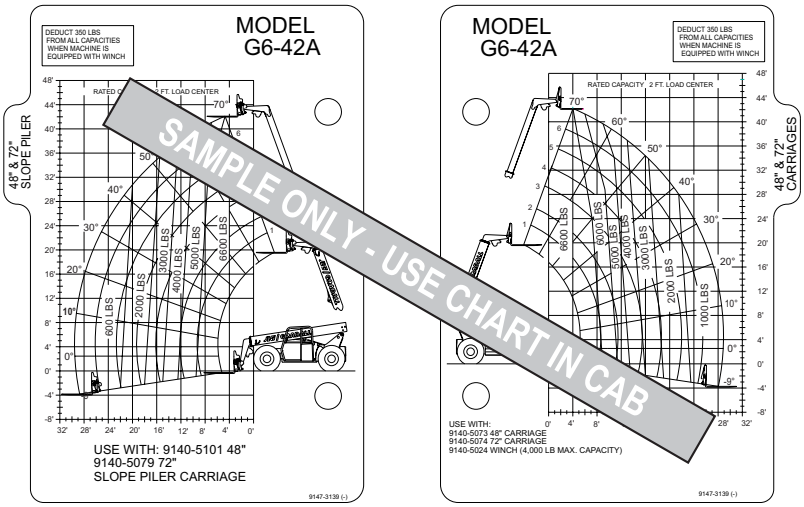

GENERAL NOTES
CAPACITY CHART
USE LARGEST NU
MATCH WITH BOOM ANGLE TO DE
FIGURES SHOWN ARE STACKING CAPACITY
RATED LIFTING CAPACITIES SHOWN ARE WITH MAC
LEVEL SURFACE WITH UNDAMAGED, PROPERLY INFLATED
MACHINE SPECIFICATIONS AND STABILITY ARE BASED ON RATED LI
CAPACITIES AT SPECIFIC BOOM ANGLES AND BOOM LENGTHS.
IF SPECIFICATIONS ARE CRITICAL, THE PROPOSED APPLICATION SHOULD BE DISCUSSED WITH YOUR DEALER.
DO NOT EXCEED RATED LIFT CAPACITY LOADS, AS UNSTABLE AND DANGEROUS MACHINE CONDITIONS WILL RESULT.
DO NOT TIP THE MACHINE FORWARD TO DETERMINE ALLOWABLE LOAD.
CERTAIN CARRIAGE/FORK COMBINATIONS MAY CAUSE HANDLER TO TIP WITHOUT LOAD WHEN EXTENDED INTO "NO OPERATION" ZONE AS NOTED ON CAPACITY CHART.
CAPACITY LIMITS FOR THIS UNIT ARE BASED IN ACCORDANCE WITH STANDARDS LISTED ON SERIAL NUMBER PLATE.
LEVEL GRADALL HANDLER BEFORE LIFTING ABOVE 4 FT.
9140-3618
GRADALL
CAPACITY
9140-3618
SAMPLE ONLY - USE CHART IN CAB

BACK FRONT

Located on dashboard
P/N 9140-3618

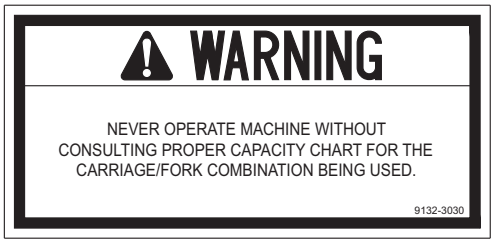


Located on right cab wall
P/N 9150-3102

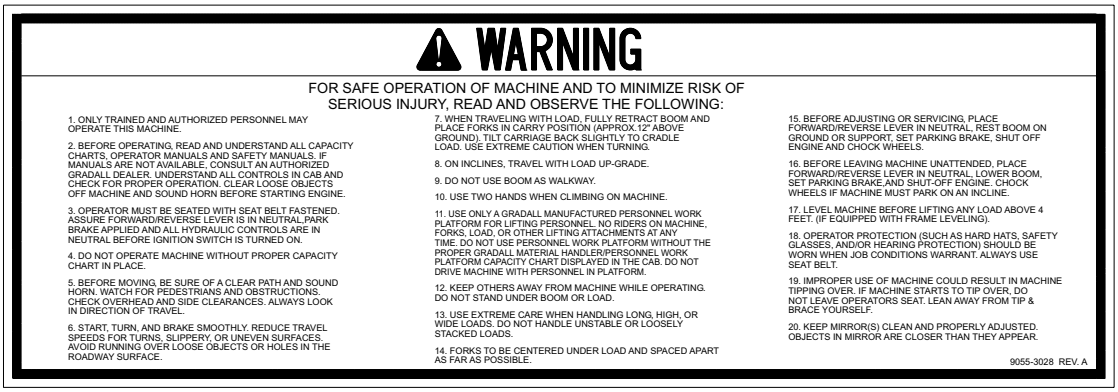

MODEL G6-42A
DEDUCT 350 LBS FROM ALL CAPACITIES WHEN MACHINE IS EQUIPPED WITH WINCH
RATED CAPACITY 2 FT. LOAD CENTER
48" & 72" SLOPE PILER
USE WITH: 9140-5101 48" 9140-5079 72" SLOPE PILER CARRIAGE
9147-3139 (-)
MODEL G6-42A
DEDUCT 350 LBS FROM ALL CAPACITIES WHEN MACHINE IS EQUIPPED WITH WINCH
RATED CAPACITY 2 FT. LOAD CENTER
48" & 72" CARRIAGES
USE WITH: 9140-5073 48" CARRIAGE 9140-5074 72" CARRIAGE 9140-5024 WINCH (4,000 LB MAX. CAPACITY)
9147-3139 (-)
SAMPLE ONLY - USE CHART IN CAB

BACK FRONT

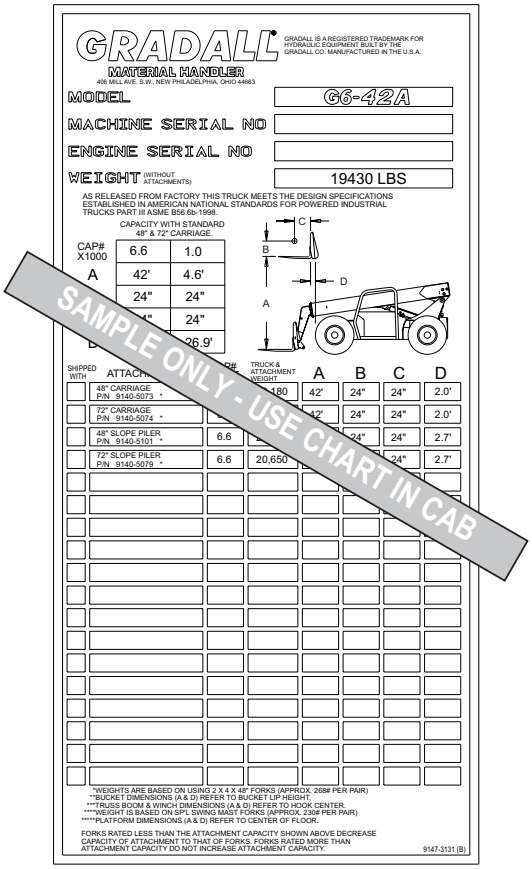
Located on dashboard
P/N 9147-3139


WARNING
NEVER OPERATE MACHINE WITHOUT CONSULTING PROPER CAPACITY CHART FOR THE CARRIAGE/FORK COMBINATION BEING USED.
9132-3030

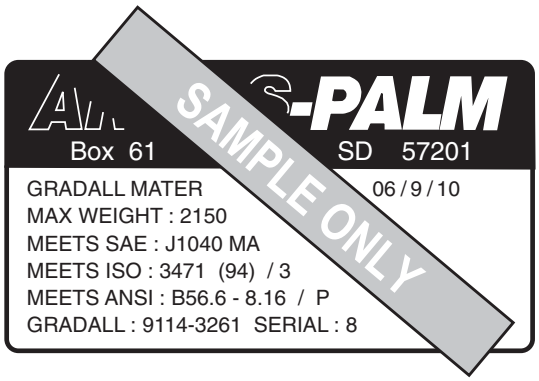
Located on right cab wall
and cab fender
P/N 9132-3030


WARNING
FOR SAFE OPERATION OF MACHINE AND TO MINIMIZE RISK OF SERIOUS INJURY, READ AND OBSERVE THE FOLLOWING:
1. ONLY TRAINED AND AUTHORIZED PERSONNEL MAY OPERATE THIS MACHINE.
2. BEFORE OPERATING, READ AND UNDERSTAND ALL CAPACITY CHARTS, OPERATOR MANUALS AND SAFETY MANUALS. IF MANUALS ARE NOT AVAILABLE, CONSULT AN AUTHORIZED GRADALL DEALER. UNDERSTAND ALL CONTROLS IN CAB AND CHECK FOR PROPER OPERATION. CLEAR LOOSE OBJECTS OFF MACHINE AND SOUND HORN BEFORE STARTING ENGINE.
3. OPERATOR MUST BE SEATED WITH SEAT BELT FASTENED. ASSURE FORWARD/REVERSE LEVER IS IN NEUTRAL, PARK BRAKE APPLIED AND ALL HYDRAULIC CONTROLS ARE IN NEUTRAL BEFORE IGNITION SWITCH IS TURNED ON.
4. DO NOT OPERATE MACHINE WITHOUT PROPER CAPACITY CHART IN PLACE.
5. BEFORE MOVING, BE SURE OF A CLEAR PATH AND SOUND HORN. WATCH FOR PEDESTRIANS AND OBSTRUCTIONS. CHECK OVERHEAD AND SIDE CLEARANCES. ALWAYS LOOK IN DIRECTION OF TRAVEL.
6. START, TURN, AND BRAKE SMOOTHLY. REDUCE TRAVEL SPEEDS FOR TURNS, SLIPPERY, OR UNEVEN SURFACES. AVOID RUNNING OVER LOOSE OBJECTS OR HOLES IN THE ROADWAY SURFACE.
7. WHEN TRAVELING WITH LOAD, FULLY RETRACT BOOM AND PLACE FORKS IN CARRY POSITION (APPROX.12" ABOVE GROUND). TILT CARRIAGE BACK SLIGHTLY TO CRADLE LOAD. USE EXTREME CAUTION WHEN TURNING.
8. ON INCLINES, TRAVEL WITH LOAD UP-GRADE.
9. DO NOT USE BOOM AS WALKWAY.
10. USE TWO HANDS WHEN CLIMBING ON MACHINE.
11. USE ONLY A GRADALL MANUFACTURED PERSONNEL WORK PLATFORM FOR LIFTING PERSONNEL. NO RIDERS ON MACHINE, FORKS, LOAD, OR OTHER LIFTING ATTACHMENTS AT ANY TIME. DO NOT USE PERSONNEL WORK PLATFORM WITHOUT THE PROPER GRADALL MATERIAL HANDLER/PERSONNEL WORK PLATFORM CAPACITY CHART DISPLAYED IN THE CAB. DO NOT DRIVE MACHINE WITH PERSONNEL IN PLATFORM.
12. KEEP OTHERS AWAY FROM MACHINE WHILE OPERATING. DO NOT STAND UNDER BOOM OR LOAD.
13. USE EXTREME CARE WHEN HANDLING LONG, HIGH, OR WIDE LOADS. DO NOT HANDLE UNSTABLE OR LOOSELY STACKED LOADS.
14. FORKS TO BE CENTERED UNDER LOAD AND SPACED APART AS FAR AS POSSIBLE.
15. BEFORE ADJUSTING OR SERVICING, PLACE FORWARD/REVERSE LEVER IN NEUTRAL, REST BOOM ON GROUND OR SUPPORT, SET PARKING BRAKE, SHUT OFF ENGINE AND CHOCK WHEELS.
16. BEFORE LEAVING MACHINE UNATTENDED, PLACE FORWARD/REVERSE LEVER IN NEUTRAL, LOWER BOOM, SET PARKING BRAKE,AND SHUT-OFF ENGINE. CHOCK WHEELS IF MACHINE MUST PARK ON AN INCLINE.
17. LEVEL MACHINE BEFORE LIFTING ANY LOAD ABOVE 4 FEET. (IF EQUIPPED WITH FRAME LEVELING).
18. OPERATOR PROTECTION (SUCH AS HARD HATS, SAFETY GLASSES, AND/OR HEARING PROTECTION) SHOULD BE WORN WHEN JOB CONDITIONS WARRANT. ALWAYS USE SEAT BELT.
19. IMPROPER USE OF MACHINE COULD RESULT IN MACHINE TIPPING OVER. IF MACHINE STARTS TO TIP OVER, DO NOT LEAVE OPERATORS SEAT. LEAN AWAY FROM TIP & BRACE YOURSELF.
20. KEEP MIRROR(S) CLEAN AND PROPERLY ADJUSTED. OBJECTS IN MIRROR ARE CLOSER THAN THEY APPEAR.
9055-3028 REV. A

Located on right cab wall
P/N 9055-3028



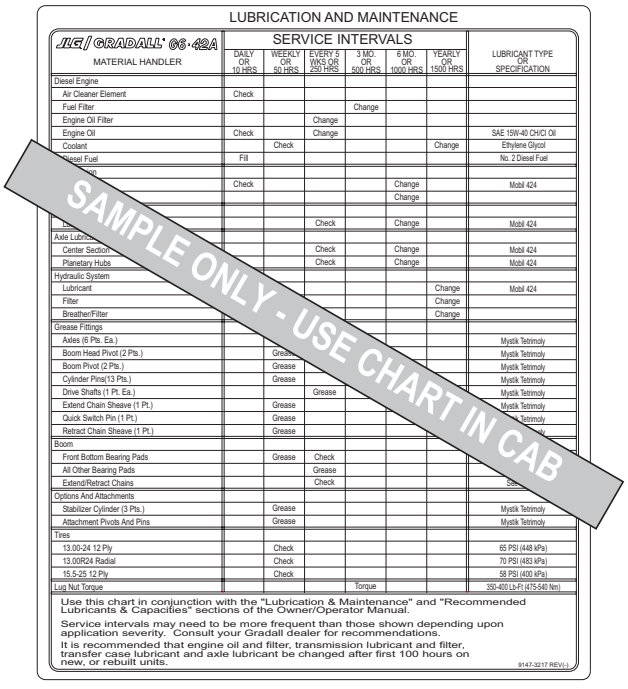
Located on right cab wall
P/N 9147-3131



Located on back wall, behind operator's seat
P/N 9147-4483 (enclosed cab)
P/N 9147-4471 (open cab)

WARNING
THE PROTECTION OFFERED BY THIS ROPS WILL BE IMPAIRED IF IT HAS BEEN SUBJECTED TO ANY MODIFICATION, STRUCTURAL DAMAGE, OR HAS BEEN INVOLVED IN AN OVERTURN INCIDENT. THIS ROPS MUST BE REPLACED AFTER A ROLL-OVER. SEAT BELTS MUST BE WORN WHILE OPERATING VEHICLE.
000850

Located on left side, front cab plate
P/N 9116-4094



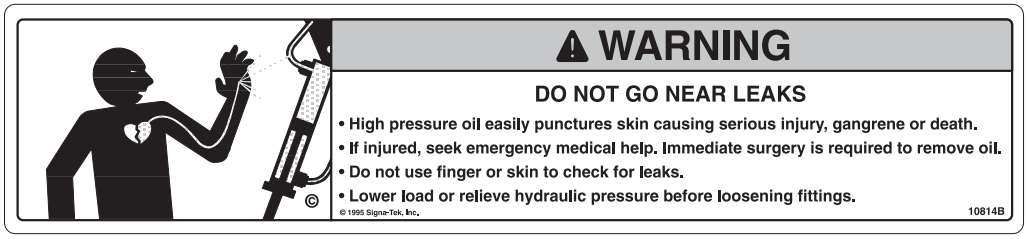
Located on right cab wall
P/N 9147-3217

WARNING
ATTACHMENT MUST BE SECURED TO MACHINE.
CHECK TO ASSURE QUICK SWITCH PLUNGER PIN IS FULLY ENGAGED AND LOCKED AFTER ATTACHMENT CHANGE.
IF PLUNGER PIN IS NOT FULLY ENGAGED AND LOCKED ATTACHMENT MAY FALL OFF CAUSING SERIOUS INJURY OR DEATH.
9114-3290

Located on boom head
P/N 9114-3290

Located on dash
Starting S/N 0160001283
P/N 9141-3061

DECALS


WARNING
DO NOT GO NEAR LEAKS
• High pressure oil easily punctures skin causing serious injury, gangrene or death.
• If injured, seek emergency medical help. Immediate surgery is required to remove oil.
• Do not use finger or skin to check for leaks.
• Lower load or relieve hydraulic pressure before loosening fittings.
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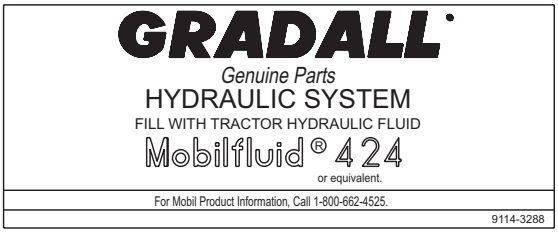
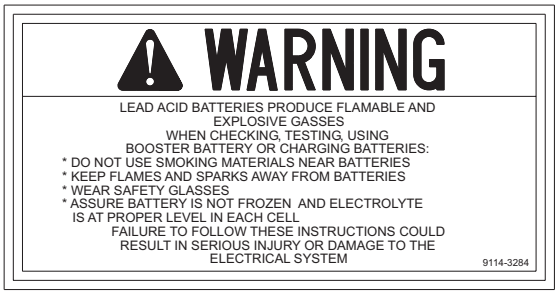
10814B

Located on frame beside main control valve
P/N 9108-3492

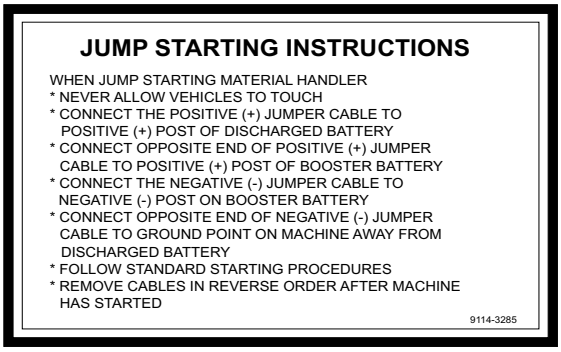


Located on hydraulic reservoir
P/N 9114-3288

Located on hydraulic fill cap
P/N 9140-3573

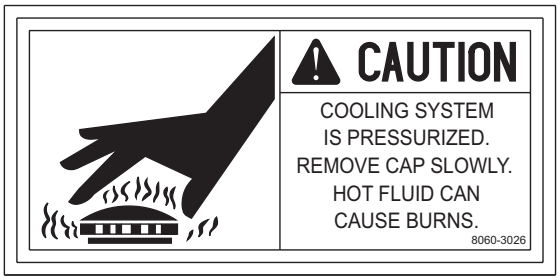

WARNING
LEAD ACID BATTERIES PRODUCE FLAMABLE AND EXPLOSIVE GASSES
WHEN CHECKING, TESTING, USING BOOSTER BATTERY OR CHARGING BATTERIES:
* DO NOT USE SMOKING MATERIALS NEAR BATTERIES
* KEEP FLAMES AND SPARKS AWAY FROM BATTERIES
* WEAR SAFETY GLASSES
* ASSURE BATTERY IS NOT FROZEN AND ELECTROLYTE IS AT PROPER LEVEL IN EACH CELL
FAILURE TO FOLLOW THESE INSTRUCTIONS COULD RESULT IN SERIOUS INJURY OR DAMAGE TO THE ELECTRICAL SYSTEM
9114-3284

Located on frame below engine cover
P/N 9114-3284

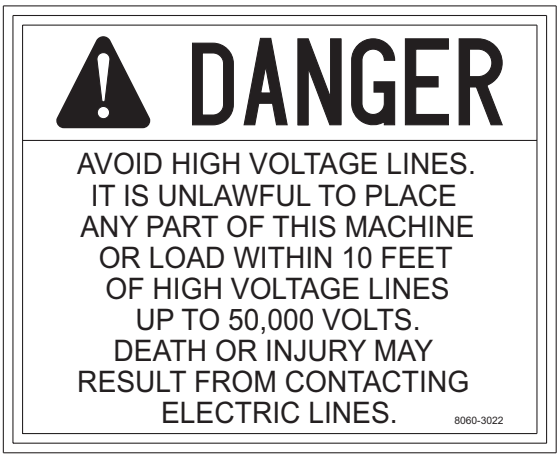

JUMP STARTING INSTRUCTIONS
WHEN JUMP STARTING MATERIAL HANDLER
* NEVER ALLOW VEHICLES TO TOUCH
* CONNECT THE POSITIVE (+) JUMPER CABLE TO POSITIVE (+) POST OF DISCHARGED BATTERY
* CONNECT OPPOSITE END OF POSITIVE (+) JUMPER CABLE TO POSITIVE (+) POST OF BOOSTER BATTERY
* CONNECT THE NEGATIVE (-) JUMPER CABLE TO NEGATIVE (-) POST ON BOOSTER BATTERY
* CONNECT OPPOSITE END OF NEGATIVE (-) JUMPER CABLE TO GROUND POINT ON MACHINE AWAY FROM DISCHARGED BATTERY
* FOLLOW STANDARD STARTING PROCEDURES
* REMOVE CABLES IN REVERSE ORDER AFTER MACHINE HAS STARTED
9114-3285

Located on frame below engine cover
P/N 9114-3285

Located in engine compartment
P/N 9114-3281

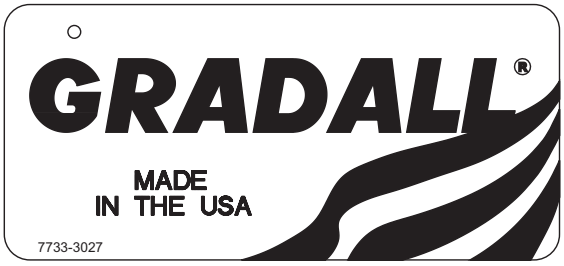


Located on radiator
P/N 8060-3026

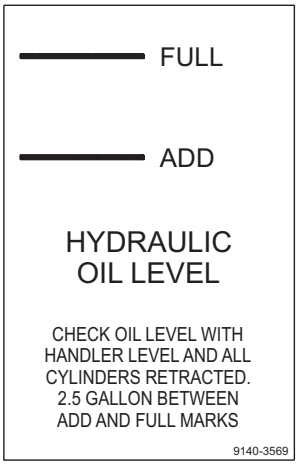


Located on cab fender
P/N 8060-3022

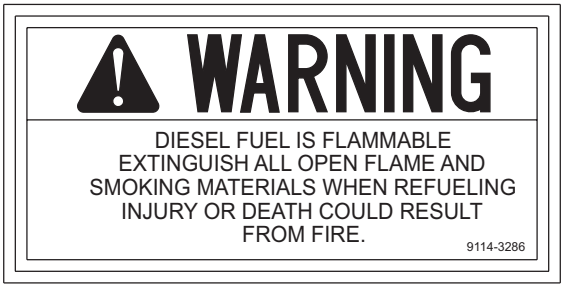
Located on left cab wall
P/N 9114-3283



Located on left cab wall
P/N 7733-3027

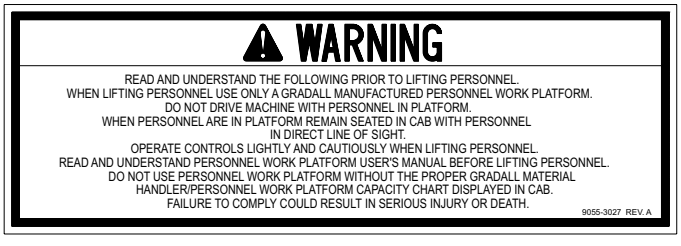


Located on hydraulic reservoir
P/N 9140-3569



Located on left cab wall
P/N 9114-3286

Located on both sides of frame
near axles and boom head
P/N 9114-3282

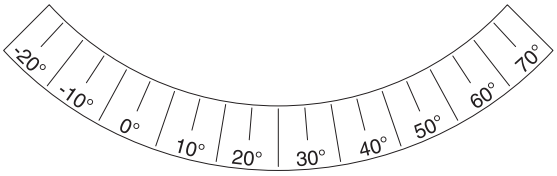

WARNING
READ AND UNDERSTAND THE FOLLOWING PRIOR TO LIFTING PERSONNEL.
WHEN LIFTING PERSONNEL USE ONLY A GRADALL MANUFACTURED PERSONNEL WORK PLATFORM.
DO NOT DRIVE MACHINE WITH PERSONNEL IN PLATFORM.
WHEN PERSONNEL ARE IN PLATFORM REMAIN SEATED IN CAB WITH PERSONNEL
IN DIRECT LINE OF SIGHT.
OPERATE CONTROLS LIGHTLY AND CAUTIOUSLY WHEN LIFTING PERSONNEL.
READ AND UNDERSTAND PERSONNEL WORK PLATFORM USER'S MANUAL BEFORE LIFTING PERSONNEL.
DO NOT USE PERSONNEL WORK PLATFORM WITHOUT THE PROPER GRADALL MATERIAL
HANDLER/PERSONNEL WORK PLATFORM CAPACITY CHART DISPLAYED IN CAB.
FAILURE TO COMPLY COULD RESULT IN SERIOUS INJURY OR DEATH.
9055-3027 REV.A

Located on mud guard
P/N 9055-3027

DECALS

Located on right rear frame
P/N 9114-3280

Located on boom
P/N 8060-3037



Located on left side of boom
P/N 9100-3031

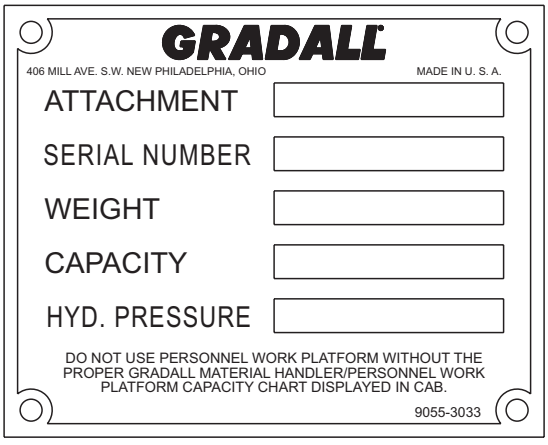
WARNING
READ AND UNDERSTAND THE FOLLOWING PRIOR TO LIFTING PERSONNEL.
WHEN LIFTING PERSONNEL USE ONLY A GRADALL MANUFACTURED
PERSONNEL WORK PLATFORM.
ALL PERSONNEL IN PLATFORM MUST WEAR A FULL BODY HARNESS WITH
LANYARD ATTACHED TO A DESIGNATED ANCHORAGE POINT.
READ AND UNDERSTAND PERSONNEL WORK PLATFORM USER'S MANUAL
BEFORE OCCUPYING PERSONNEL WORK PLATFORM.
FAILURE TO COMPLY COULD RESULT IN SERIOUS INJURY OR DEATH.
9055-3026 REV. A

Located on boom head & personnel work platform
P/N 9055-3026

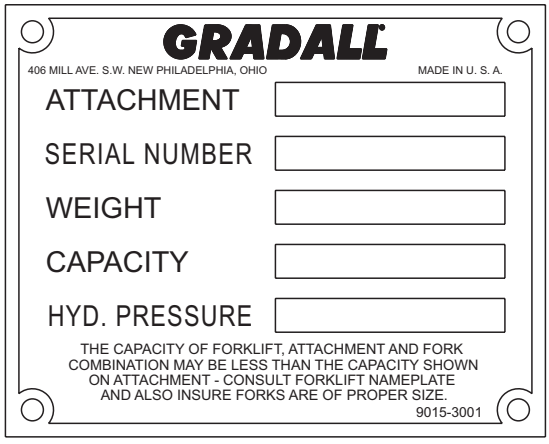
WARNING
MAXIMUM OCCUPANCY THREE (3) PEOPLE.
DO NOT USE PERSONNEL WORK PLATFORM
WITHOUT THE PROPER GRADALL MATERIAL
HANDLER/PERSONNEL WORK PLATFORM
CAPACITY CHART DISPLAYED IN CAB.
FAILURE TO COMPLY COULD RESULT IN
SERIOUS INJURY OR DEATH.
9055-3031 REV. A

Located on Personnel work platform
P/N 9055-3031

Located on work platform
P/N 9055-3032



Located on Personnel Work Platform
P/N 9055-3033



Located on attachment
P/N 9015-3001

OPERATOR'S CAB

The cab permits vision from all sides and includes an overhead guard to provide protection from falling objects.

A fully-enclosed cab with windows and a lockable door is available as an option. The top half of the cab door must be secured in the fully-opened or closed position. The bottom half of the cab door can be secured in the closed position only. Be sure the door is fully secured when operating the handler.

The operator's seat is equipped with a seat belt and includes fore and aft adjustment to compensate for variations in operator size. The adjustment release/lock is located on the side of seat. **Wear seat belt when operating machine.**

An optional windshield wiper/washer is available for use with enclosed cabs. A control switch is located on the instrument panel.

A variable-speed defroster fan is available for use with enclosed cabs. An "On/Off" control switch and speed control are located on the base of the fan.

The heater fan speed is controlled by a knob on the panel to the right of the operator's seat. Hot water to the heater can be controlled by a knob on the same panel or a valve in the engine compartment.

The operator's cab is an S.A.E. "FOPS/ROPS" structure. Do not make any modification to this structure. If damaged, the cab cannot be repaired. It must be replaced.

WARNING

Never operate the handler unless the overhead guard is in good condition.

WARNING

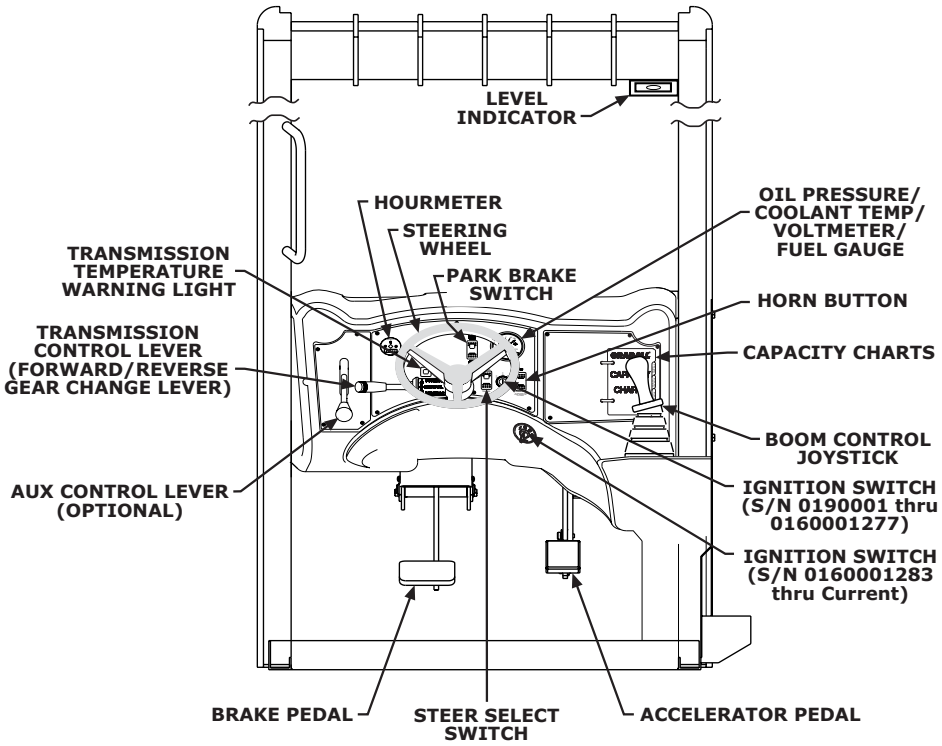
Any modification which adds weight to this machine must be approved by GRADALL to assure compliance with FOPS/ROPS certification for this cab/machine configuration.

NOTE!

Relevant S.A.E. Recommended Practices:
S.A.E. J1040 for ROPS
S.A.E. J231 for FOPS

CONTROL AND INSTRUMENT IDENTIFICATION

Figure 3-1



OPERATOR'S CAB

Accelerator Pedal: Depress pedal to increase speed and release pedal to decrease speed.

Attachment Tilt Lever: This lever controls tilt of the fork carriage. Speed is proportional to lever actuation and engine RPM. Push lever forward to tilt down; pull lever back to tilt up.

Attachment Tilt Switch (optional): Depress left side of switch to tilt down; depress right side of switch to tilt up.

Auxiliary Control Lever (optional): This lever is used to control optional hydraulic attachments. Follow decal instructions for lever/handler movements.

Auxiliary Light Switch (optional): This switch turns auxiliary lights on and off.

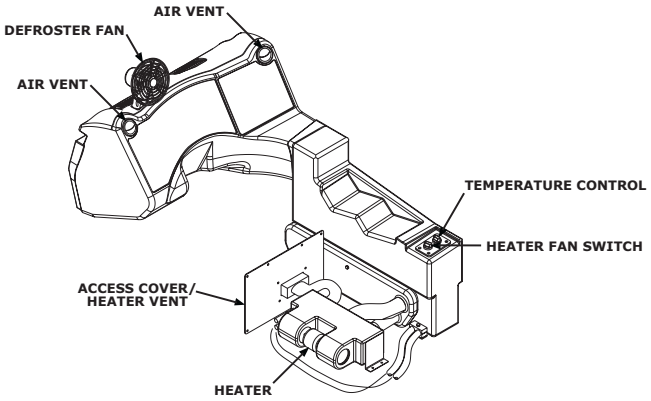
Boom Control Joystick: This joystick controls boom elevation and extension. Pull joystick back to raise boom; push joystick forward to lower boom. Move joystick to right to extend boom; move to left to retract boom. Speed of boom movement is proportional to joystick actuation and engine RPM.

Engine Coolant Temperature Gauge: This gauge displays engine coolant temperature.

Engine Oil Pressure Gauge: This gauge displays engine oil pressure.

Fuel Gauge: This gauge displays level of fuel in fuel tank.

Heater Fan Switch (optional): This switch turns heater fan on and off.



Horn Button: Depress button to sound horn.

Hourmeter: This meter indicates total time of engine operation in hours and tenths of hours.

Ignition Switch: This switch is actuated by a key. In "ACC" or "RUN" position, voltage is available for all electrical functions. Full clockwise rotation to "START" engages starter motor. Counter-clockwise rotation to "OFF" stops engine and removes voltage from all electrical functions.

Level Indicator: This bubble level indicator enables the operator to determine the left to right level condition of the handler.

Lights Switch (optional): This switch controls optional lighting which may be provided with the handler.

⚠ WARNING

A brief description of controls and instruments is provided here as a convenience for the operator. These descriptions DO NOT provide complete operation instructions. Read & understand this Manual and the GRADALL Material Handler Safety Manual.

Machine Level Lever: This lever controls the relationship of the handler frame to the front axle. Move the lever left to tilt frame to left, move the lever right to tilt frame to right.

Neutral Lock Lever: The transmission control switch is equipped with a lever that locks the transmission in neutral when activated.

Parking Brake Switch: This switch controls the application and release of the parking brake. Indicator light on switch glows (red) to indicate brake is applied.

Seat lock Release Lever: This lever unlocks and locks seat position adjustment.

Service Brake: The further the pedal is depressed, the slower the travel speed. Full depression of pedal causes full service brake application.

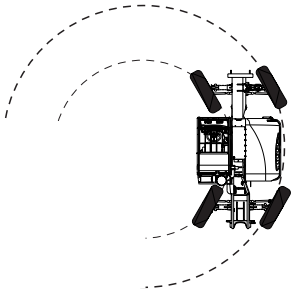
Steer Select Switch: This switch has three positions to allow selection of 4-wheel circle steer, 4-wheel crab steer and 2-wheel steer. 4-wheel circle steer allows the front and rear wheels to steer in opposite directions for tight turns. 4-wheel crab steering turns the front and rear tires in the same direction for moving the machine to the side. 2-wheel steer allows only the front wheels to steer.

Steering Wheel: The steering wheel controls the angle of wheels. Turning the steering wheel to the right causes a right turn. Turning the steering wheel to the left causes a left turn.

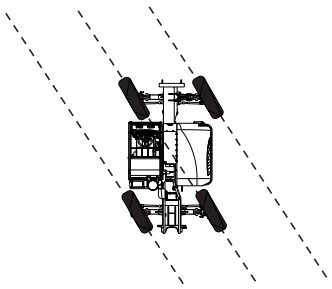
Transmission Control: This lever engages forward or reverse travel. Push lever fully forward for forward travel; pull lever fully backward for reverse travel. Move lever to centered position for "Neutral." Twist hand grip for 1st, 2nd, 3rd, and optional 4th (forward only) gear.

Transmission Temperature Light: This light will illuminate during starting procedure for a bulb check. If transmission temperature exceeds 250° light will glow indicating the need for service.

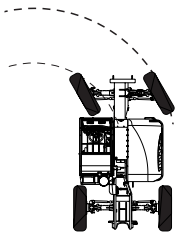
Voltmeter: This gauge indicates alternator output and battery condition.



4-Wheel Circle Steer



4-Wheel Crab Steer



2-Wheel Front Steer

⚠ CAUTION

If transmission temperature light glows, move material handler to a safe location and shut down.

⚠ CAUTION

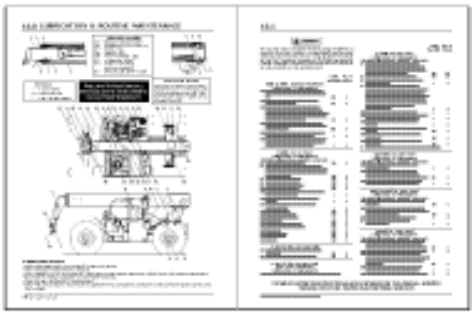
When traveling at higher speeds use 2-wheel front steering.

CHECKS & SERVICES BEFORE STARTING ENGINE

To be performed at the beginning of each work shift.

- Check to be sure the material handler is equipped with the proper load/capacity chart and that it is legible before operating.
- If spark arrestors are required, be sure they are in place and in good working order.
- Check to be certain that windows and mirror(s) are clean and undamaged. Also make certain that mirror(s) are properly adjusted for operator's view.
- Before removing filler caps or fill plugs, wipe all dirt and grease away from the ports. If dirt enters these ports, it can severely reduce component life.
- When adding fluids, refer to lubrication section of Manual to determine proper type.

Complete all required maintenance before operating unit.



Service the unit in accordance with the ***"Lubrication and Routine Maintenance" schedule, pages 17.1 and 17.2.***

Inspect all structural members, including attachment, for signs of damage.

(Optional Turbo Charged Engine Shown)

Inspect unit for obvious damage, vandalism and necessary maintenance. Check for signs of fuel, lubricant, coolant and hydraulic leaks. Open all access doors and look for loose fittings, clamps, components and attaching hardware. Replace hydraulic lines that are cracked, brittle, cut or which show signs of leakage or abrasion.

⚠ WARNING

Use extreme caution when checking items beyond your normal reach. Use an approved safety ladder.

⚠ WARNING

Before operating handler, complete all required maintenance. Replace or repair all damaged, worn or missing components before starting or operating handler. Failure to properly maintain handler could cause serious injury or death.

⚠ WARNING

*Use a piece of cardboard or paper to search for leaks. **DO NOT** use bare hands. If anyone is injured by hydraulic fluid, including penetration of the skin, obtain medical help **immediately**!*

To be performed at beginning of each work shift.

The safety, efficiency and service life of your handler will be increased by performing the operational checks listed below. Items preceded by an asterisk (*) are optional and may not be furnished on your machine.

Before entering the operator's cab, check:

1. Engine oil level.
2. Air Filter Restriction Indicator. If needle is in red area, filter is clogged and element must be cleaned or changed.

During warm-up period, check:

* 3. Heater, defroster and windshield wiper.
4. Hydraulic oil level.
* 5. Operating lights and rotating beacon.
6. Voltmeter-should show 13.5 to 14 volts.

When engine warms to operating range, check:

7. Transmission fluid level.
8. Service brake and parking brake.
9. Forward and reverse travel.
10. Each of the gear ranges.
11. Steering (stop to stop in both directions) with engine at low idle. Check in each steering mode.
12. Horn and back-up alarm. Must be audible from inside operators cab with engine running.
13. All boom and attachment functions - operate smoothly and correctly.
14. Hydraulic Filter Condition Indicator - observe engine coolant temperature gauge after starting normal operation. When needle has been in operating range for an hour or so, stop handler in a safe area, apply parking brake, lower forks fully, shift forward/reverse lever to "Neutral" position and chock wheels. With engine running at full throttle, have an assistant check the Hydraulic Filter Condition Indicator. When bar gauge is in red area, filter is clogged and hydraulic oil is bypassing filter. Filter element must be changed before reaching bypass condition (change before needle reaches red area).

Complete all required maintenance before operating unit.

⚠ WARNING

Check all tires and rims periodically for damage due to impact. Replace before use if damage is detected.

⚠ CAUTION

Keep engine cover closed while engine is running except when checking Transmission Oil Level and hydraulic filter condition indicator.

⚠ CAUTION

Continued operation with hydraulic fluid bypassing the filter may cause severe damage to hydraulic system components.

ENGINE OPERATION

Starting the Engine

1. Make sure all controls are in "Neutral" and all electrical components (lights, heater, defroster, etc.) are turned off. Set parking brake.

2. Depress accelerator pedal approximately 1/4 to 1/3 of travel from top.

3. Turn ignition switch to "START" to engage starting motor. Release key immediately when engine starts. If engine fails to start within 20 seconds, release key and allow starting motor to cool for a few minutes before trying again.

4. After engine starts, observe oil pressure gauge. If gauge remains on zero for more than ten seconds, stop engine and determine cause. Correct malfunction before restarting engine. Minimum pressure at operating temperature:
   Low idle: 10 PSI (69kPa)

5. Warm up engine at approximately 1/2 throttle until engine coolant temperature reaches operating range.

⚠ WARNING

Operator must be seated with seat belt fastened, transmission control lever in "Neutral" position, parking brake applied and all hydraulic controls in "Neutral" before starting engine.

⚠ CAUTION

Turning ignition switch to "START" position while engine flywheel is rotating may cause serious damage to engine and/or starting motor.

NOTE!

Engine will not start unless transmission control lever is in "Neutral" and parking brake switch is applied.

Cold-Weather Starting Aids

In cold weather situations, a supplemental starting aid may be required. Gradall-approved starting aids employ ether. If your handler is equipped with an ether starting aid, the following applies:

- All employed ether is triggered by temperature gauge located on engine.
- At start-up, temperature gauge on engine will detect if ether is needed. Follow normal start-up procedure, shown above.
- Ether is employed and additional will be released if needed, to keep engine running.
- A second battery is added for additional cold-cranking capacity.

⚠ CAUTION

If your machine is equipped with a cold start aid, do not spray additional ether into air cleaner.

If machine is not equipped with cold start aid, follow instructions listed in the engine manual supplied with machine.

Battery-Boosted Starting

If you ever have to battery-boost start (jump-start) your handler, proceed as follows:

- Never allow vehicles to touch
- Connect the positive (+) jumper cable to positive (+) post of discharged battery
- Connect opposite end of positive (+) jumper cable to positive (+) post of booster battery
- Connect the negative (-) jumper cable to negative (-) post on booster battery
- Connect opposite end of negative (-) jumper cable to ground point on machine away from discharged battery
- Follow standard starting procedures
- Remove cables in reverse order after machine has started

Normal Engine Operation

Observe gauges frequently to be sure all engine systems are functioning properly.

The voltmeter shows the "charge/discharge" state of the battery charging system. With the engine running, meter should indicate 13.5 to 14 volts. With engine stopped, meter indicates battery charge (12 volts).

Be alert for unusual noises or vibration. When an unusual condition is noticed, park machine in safe position and perform standard shut-down procedure. **(See Page 1.1)** Report condition to your supervisor or maintenance personnel.

Avoid prolonged idling. Idling causes engine temperature to drop and this permits formation of heavy carbon deposits and dilution of lubricating oil by incompletely-burned fuel. If the engine is not being used, turn it off.

Stopping the Engine

- **To stop engine, perform standard shut-down procedure.**
- Operate engine at low idle for 3 to 5 minutes before **turning it off.** This allows engine coolant and lubricating oil to carry excessive heat away from critical engine areas, including turbocharger.
- **Do not "gun" engine before shut down:** This practice causes incompletely-burned fuel to remove oil film from cylinder walls and dilute lubricant in crankcase.

General

The brake system includes a service brake and a parking brake. Service and parking brakes are applied through wet disc brake packs located within axle housing.

Service Brakes

Depressing the service brake pedal causes controlled hydraulic pressure to be applied to service brakes. The greater the pedal travel, the greater the braking force.

If power-assist fails, it will require much greater force on pedal to apply brake and stopping distance will be greater.

Parking Brakes

The parking brakes are spring-applied and hydraulically-released.

Pressure to release parking brakes is provided by the hydraulic system and is controlled by the parking brake switch located on the dashboard.

With the engine running and the parking brake switch "Off", parking brakes are disengaged. Moving the switch to "On" releases hydraulic pressure to apply the parking brakes. With switch in "On" position, the transmission will not engage forward or reverse.

⚠ WARNING

If power-assist feature should fail for any reason, it would require greater effort to apply service brake. If power assist fails, stop as soon as possible. Do not drive the handler until problem has been corrected.

⚠ WARNING

Always move parking brake switch to "On" position before leaving cab. Never stop engine while traveling. Parking brake will be fully-applied and unit could stop abruptly. A sudden stop could cause load loss.

⚠ WARNING

Always ensure that transmission control lever is in neutral before releasing park brake. Releasing park brake in either forward or reverse could cause the machine to move abruptly.

Precautions

- Avoid parking on slopes or near an excavation.
- Park on level ground and chock wheels.
- Avoid parking on roads or highways. If it cannot be avoided, be sure to display warning flags during day and flares or flashing lights at night.
- Position attachment on ground; never leave machine with boom in air.
- If parking on a slope cannot be avoided, position the handler at a right angle across the slope, straighten and chock all wheels.

Parking procedure

1. Using service brake, stop the handler in an appropriate parking area.
2. Shift transmission control lever to "Neutral".
3. Move parking brake switch to "On".
4. Position attachment on ground.
5. Allow engine to cool at idle speed for 3 to 5 minutes, stop engine and remove ignition key.
6. Chock wheels as an extra precaution against rolling.
7. Fill fuel tank to minimize condensation.
8. Lock cab and install protective covers, if so-equipped.
9. Disconnect battery if unit is in an area where tampering is a risk.

STEERING SYSTEM

- Three modes of steering are provided as standard equipment. A three position switch on the dashboard allows the operator to select the steering mode.
    - 4-wheel circle steer allows for tight turns and better maneuverability in close quarters.
    - 4-wheel crab steering allows the machine to move sideways at an angle, and is used to position the machine.
    - 2-wheel front steer is used for high speed travel.
- An optional fourth mode is available which allows for 2-wheel rear steering. A two position switch on the dash allows the operator to select front or rear steering when in the 2-wheel steer mode. This mode can be used for easier positioning of the machine when picking up a load.
- It is imperative that the operator practice maneuvering the handler in a safe, open area to become thoroughly familiar with steering response and clearance required for fork swing and load when turning.

⚠ WARNING

Be alert for any increase in effort needed to steer. If any difference is noted, notify maintenance personnel immediately. If power assist feature should fail for any reason, IT WOULD BECOME VERY DIFFICULT TO STEER. For this reason it is extremely important that you NEVER TURN ENGINE OFF WHILE TRAVELING. In the event power steering fails, stop as soon as possible. Do not drive handler until problem has been corrected.

⚠ WARNING

Use only 2-wheel steer when traveling at high speeds. Never use 4-wheel circle steer at high speeds, sharp turns could cause machine roll-over.

General

This model material handler is equipped with a powershift transmission. With this type of transmission, the operator simply selects a gear, selects the direction of travel, releases brakes and depresses the accelerator pedal to move the handler.

Operation

Gear Selection: A three-speed transmission is used on machines equipped with the naturally aspirated engine. Each gear is available in both forward and reverse. Turbocharged engines use a four-speed transmission. These transmissions have four forward gears and three reverse gears.

Gear selection is accomplished by rotating the twist grip handle on the transmission control lever. It is best to begin travel in a lower gear, however the machine will move away from rest in any gear. Upshifts are most smoothly accomplished by lifting off the throttle pedal when shifting. Caution should be taken of downshifting to ensure that the ground speed of the material handler has slowed sufficiently so as not to over-speed the engine.

Select the appropriate gear for the task being performed. Use a lower gear when transporting a load. Use a higher gear only when traveling longer distances without a load. When traveling through deep mud, or up slopes, use a lower gear. Downshift a gear when traveling down a long hill. Use the service brakes, if necessary, to prevent over-speeding the engine.

Direction of Travel: Direction of travel is selected by moving the transmission control lever towards the front of the machine for forward travel, and towards the rear of the machine for reverse travel. Neutral is selected by moving the transmission control lever to the center position. If neutral is selected while the machine is moving, the machine will continue rolling in the direction of travel.

Always bring the machine to a complete stop before changing direction of travel. This will prevent damage to the transmission or torque converter.

Forward or reverse travel can be selected while in any gear. With turbocharged engine, if reverse is selected while in fourth gear, the transmission will automatically default to third gear. If forward is selected again, the transmission will go back to fourth gear.

⚠ WARNING

Bring handler to a complete stop before shifting transmission control lever. A sudden change in direction of travel could reduce stability and/or cause load to shift or fall.

LEVELING THE HANDLER

"Leveling" means positioning the handler so that it is level from side to side (left to right). A level indicator is located in upper right corner of front window frame to permit operator to determine whether the handler frame is level.

There are four very important things to remember about handler leveling:

1. Never engage a load or lift a load more than 1.2m (four feet) above ground unless handler is level.

2. A handler with the boom raised and/or an attachment installed is a partially-loaded handler.

3. Once the handler frame is level and the operator has raised a load more than 1.2m (four feet) above ground, it must not be moved from this position if such movement could change the level condition. Do not use sway to level handler with load more than 1.2m (four feet) above ground.

4. The combination of side tilt and load could cause the handler to tip over.

Level the handler:
The surface which will support the handler can be leveled. This method must be chosen if it will be necessary to move the handler from its position after the load has been raised over 1.2m (four feet) from ground AND such movement could change the level condition.

Remember: The supporting surface must be large enough, smooth enough and firm enough to keep the handler level when it is moved from its position.

The handler may be leveled by means of the frame-leveling system. This method may be chosen when it will not be necessary to move the handler from its position after the load has been raised above 1.2m (four feet) from ground - OR - when such movement will not change the level condition of the handler.

Always determine best position for handler to raise load from its present location and also to position load at its destination. **THEN** determine which method of leveling will be required at each location.

FINALLY, consider terrain between present location of load and its destination. Never attempt to transport a load across terrain which could cause handler to tip over.

Leveling Handler Frame:
The handler is designed to permit tilting main frame 10° to left or right to compensate for uneven ground conditions.

Optional rear-axle stabilization is available for Material Handlers covered by this manual. This system includes a hydraulic cylinder attached to the frame and the rear axle, as well as flow-restricting valving. This system dampens rear-axle oscillation whenever the boom is raised over 45° from level. **However, the system never locks the rear axle and is not designed to increase lateral stability.**

Leveling Procedure:

Position machine in best location to lift or place load, position forward/reverse lever in neutral and apply parking brake. Observe level indicator to determine whether machine must be leveled and level machine with the machine level lever.

⚠ WARNING

Raising the boom (loaded or unloaded) when handler is leaning to one side could cause machine to tip over with little or no warning and cause serious injury or death.

⚠ WARNING

If handler cannot be leveled using leveling system, do not attempt to raise or place load. Have surface leveled.

Hydraulic Controls

All boom and attachment movements are governed by hydraulic controls. Rapid, jerky operation of hydraulic controls will cause rapid, jerky movement of the load. Such movements can cause the load to shift or fall or may cause the machine to tip over.

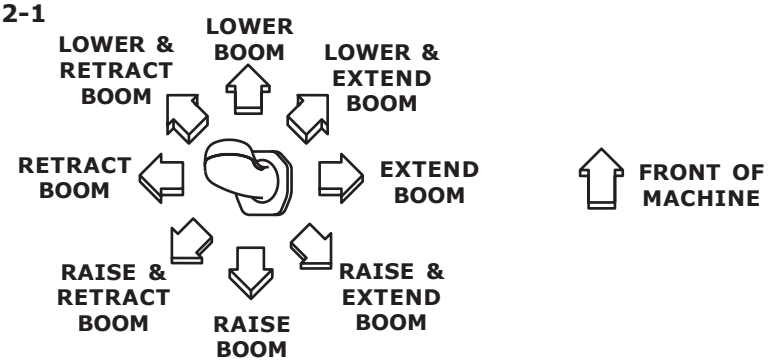
Feathering

Feathering is a control operation technique used for smooth operation. To feather controls, move control lever very slowly until function begins to move, then gradually move lever further until function is moving at desired speed. Gradually move lever toward "Neutral" as load approaches destination. Continue to reduce load speed to bring load to a smooth stop. Feathering effect can be increased by reducing engine speed at beginning and near end of load movement.

Boom Control Joystick

The boom control joystick can be positioned to activate individual boom movements or combinations of boom movements as illustrated:

Figure 12-1



With boom raised above horizontal, forks can be inserted under a load by moving boom control joystick forward and to the right until forks move forward horizontally.

With boom raised above horizontal, forks can be removed from a load by moving boom control joystick back and to the left until forks move rearward horizontally.

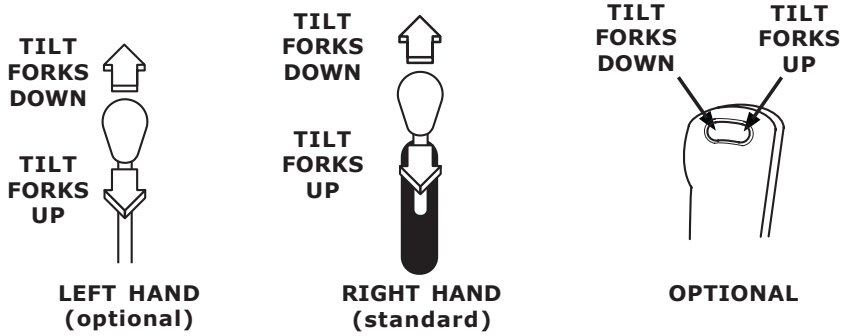
With boom lowered below horizontal, forks can be inserted under a load by moving boom control joystick back and to the right until forks move forward horizontally.

With boom lowered below horizontal, forks can be removed from a load by moving boom control joystick forward and to the left until forks move rearward horizontally.

The closer the boom is to horizontal, the less boom raise/lower movement required for inserting and removing forks.

Carriage Tilt Controls

Figure 12-2



NOTE!

Much of the material in this section may be new to even the experienced operator.

⚠ WARNING

Do not permit lift cylinders to hit the end of their stroke. The jolt could topple loads, causing a hazard to personnel and equipment nearby.

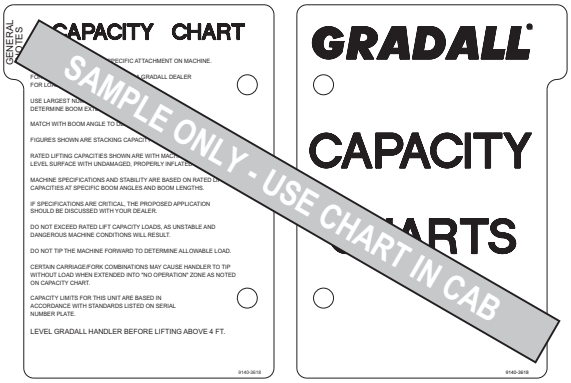
⚠ WARNING

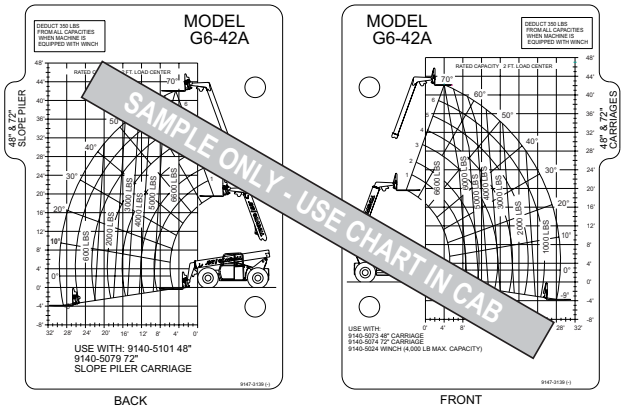
Always move boom to carry position (horizontal or below) before leveling frame. Attempting to level machine with boom raised could cause it to tip over.

Rated Capacity Chart

The rated capacity chart, located on dashboard, indicates maximum load capacities for handlers equipped with GRADALL-furnished carriage/fork or other attachment combinations. These capacities apply to standard carriage/fork and other attachment combinations except as stated on the capacity chart.

Figure 12-3




MODEL G6-42A
DEDUCT 350 LBS FROM ALL CAPACITIES WHEN MACHINE IS EQUIPPED WITH WINCH
48" & 72" SLOPE PIER
USE WITH: 9140-5101 48" 9140-5079 72" SLOPE PILER CARRIAGE
SAMPLE ONLY - USE CHART IN CAB
MODEL G6-42A
48" & 72" CARRIAGES
BACK
FRONT

NOTE!

See page 12-3 for instructions on how to read capacity charts.

⚠ WARNING

All loads shown on rated capacity chart are based on machine being on firm, level ground; the forks being positioned evenly on carriage; the load being centered on forks; proper size tires being properly inflated; and the handler being in good operating condition.

Elevation

Numbers at left side of sample chart represent elevation to top of horizontal fork as measured from level ground (in feet). Elevation relates to dimension "A" shown on serial number plate inside operator's cab.

Boom Extension

Numbers across bottom of sample chart and numbers parallel to boom represent boom reach as measured from front of front tires to extended position.

Number decals on boom relate directly to boom extension. The largest number which can be read from operator's seat indicates total boom extension and must be matched with boom angle to determine load capacity.

Boom extension relates to dimension "D" shown on serial number plate.

Boom Angle

Numbers shown at ends of angled lines represent angle of boom to horizontal as measured from horizontal. Maximum angles are -9° below horizontal with boom fully lowered to 70° above horizontal with boom fully raised.

A boom angle indicator is located on left side of boom-section 1 to show boom angle. **Be sure machine is level from front to rear or indicator will provide incorrect reading.**

Load Center

Loads shown on rated capacity chart are based on the load center being 610mm (two feet) above and 610mm (two feet) forward of surfaces of horizontal forks.

The load center of a load is the center of gravity of the load. For regularly-shaped loads of the same material, such as a pallet of blocks, the center of gravity can be located by measuring the load to find its center. For irregular loads, or loads of dissimilar materials, keep the heaviest part of the load as close to the heel of the forks as possible.

In all cases, the load center must be centered between the forks.

Load Limits

Some capacities shown on the rated capacity chart are based on machine stability and some are based on hydraulic lift capacity. The "common sense " or "feel" an experienced operator might apply in regard to "tipping loads" **DOES NOT APPLY** to hydraulic load limits. Exceeding load limits can cause damage, or, in some cases, cause the machine to tip over.

Items needed to Use a Capacity Chart

There are five items you must know and/or have in order to properly use a Capacity Chart:

1. The weight of the load to be lifted
2. The angle of the boom
3. How much boom extension will be needed
4. The proper Capacity Chart
5. A Gradall-approved Attachment

NOTE!

Some attachments may not be approved for use with certain machine models.

Every Gradall attachment comes with its own Identification Plate. This Plate has the Attachment Serial Number, Part Number, Attachment Capacity and Attachment Weight stamped on it. Make sure that the Capacity Chart you are using matches the attachment exactly. This may be done by matching the attachment part number on the Capacity Chart to the part number stamped on the Identification Plate. The Machine Serial Number Plate is mounted inside the cab and lists all standard attachments that may be used with the machine by part number, at the time it was shipped from the factory. Be aware that a specific Capacity Chart must not only match the attachment, but also the machine model.

The boom angle can be determined by looking at the angle indicator mounted on the side of the boom. **(See figure 12-4)**

The boom extension can be determined by looking at the second boom section. As the second boom section slides out of the main boom, numbers are revealed starting with 1. Each number represents approximately 5 feet of total boom extension. **(See figure 12-4) It is important to remember that these numbers are designed to be read from the *operator's seat only!***

How to read a Capacity Chart

When reading the capacity chart you must check to be sure the correct model number is listed. **(See figure 12-5)** The next thing to look for is that the part number of your attachment is listed under the "Use With" section.
Identify and find the amount of boom extension required, along with the angle of the boom. Trace the boom extension arc down until it intersects with the appropriate boom angle. If the intersection of the boom extension arc and the boom angle line occur within a weight region, the value within that region is the maximum capacity for that particular lift. If the intersection occurs on a bold line separating capacity regions, the smaller of the two values must be used. The regions are clearly marked with heavier outlines as shown on page 12.4. If you do not have the correct capacity chart for your machine and/or attachment, contact your Distributor or Gradall to order one.

Example:

A contractor has purchased a G6-42A with the 48" Slope Piler Carriage Attachment. **(See figure 12-5)** He knows his attachment may be used with this model since the attachment part number, 9140-5101, matches the attachment part number stamped on the machine Serial Number Plate. He also knows that the Capacity Chart is correct since it is clearly marked for use with a G6-42A and that the attachment he is using is listed at the bottom by part number. He has determined the weight of the load to be lifted is 400 lbs. and that he needs to place the load at a boom extension of 6 at a boom angle of 20°. By tracing the boom extension arc down to where the 20° line intersects it, the contractor can see that the maximum weight he can lift is 600 lbs. In this case, he may lift the load.

Figure 12-4: Where to look on the machine

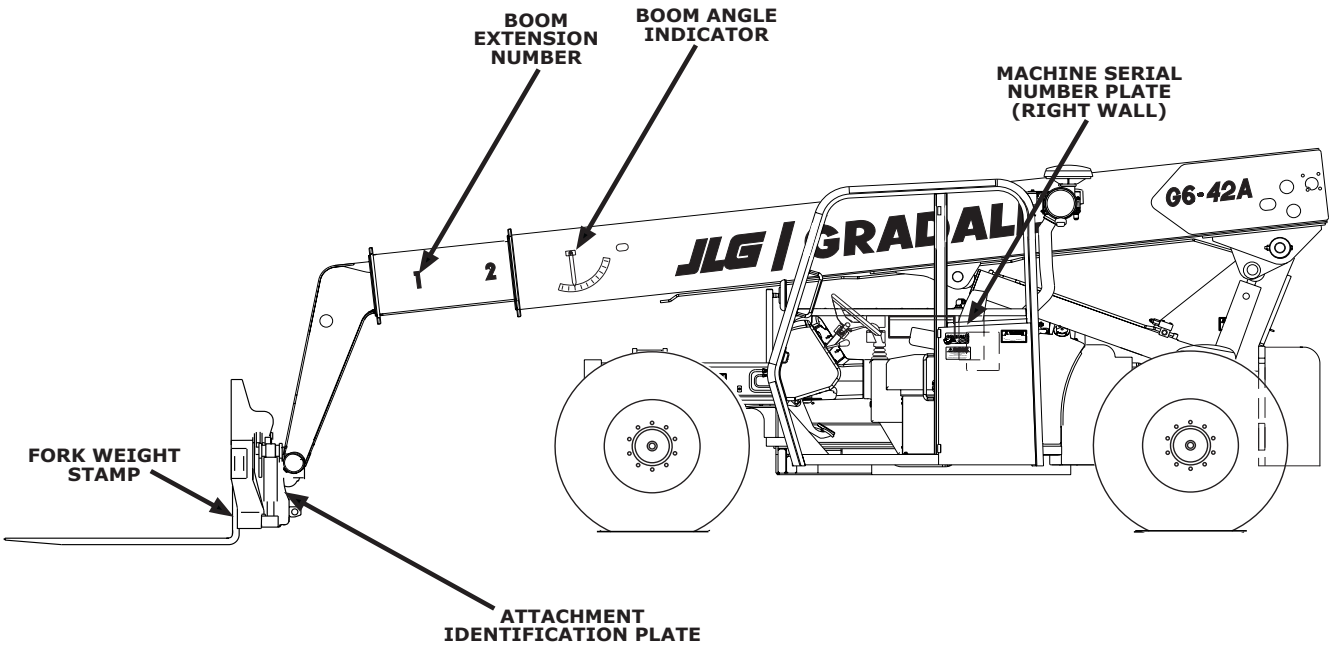
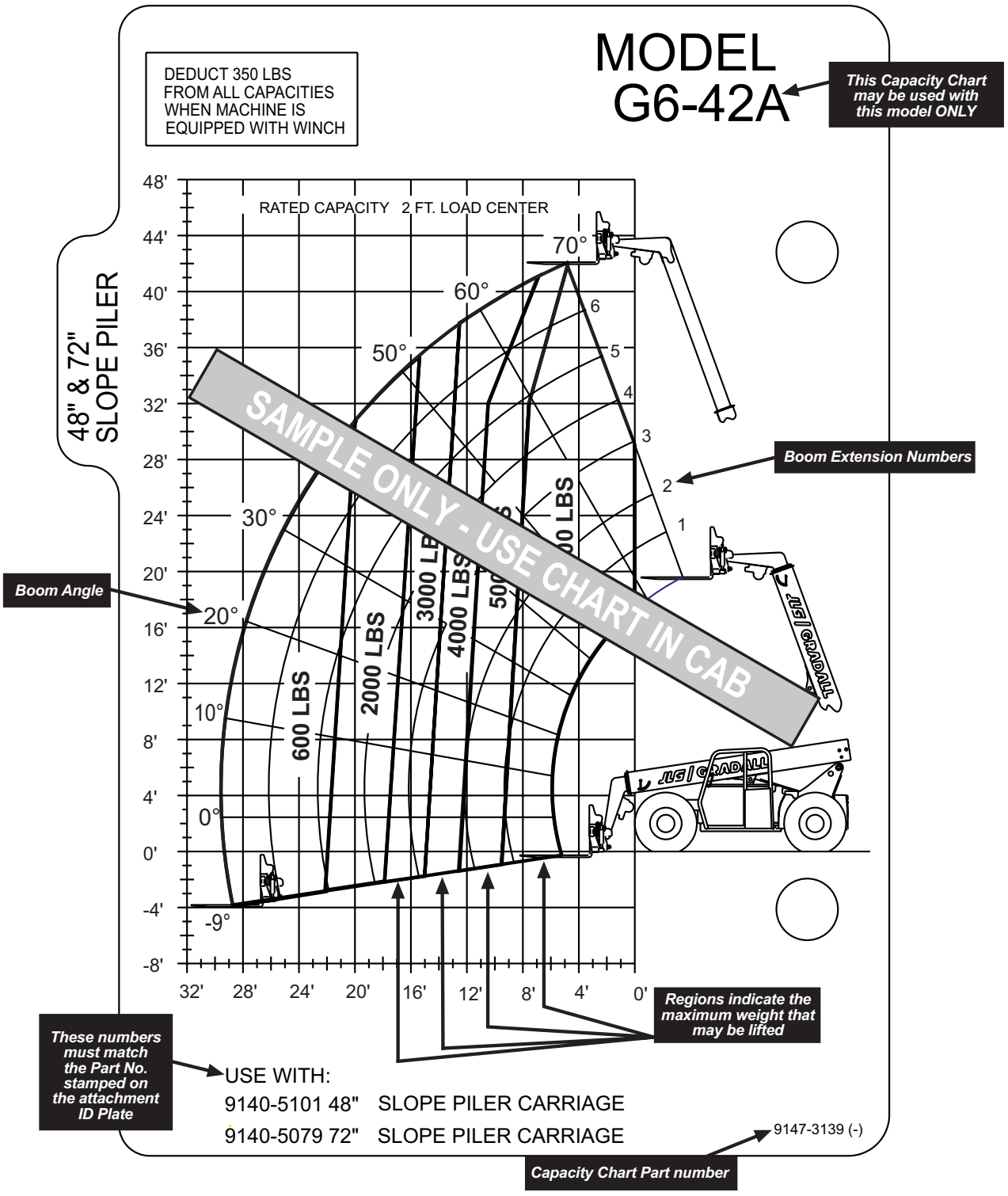


Figure 12-5: Description of items on a Capacity Chart

NOTE!

This is a sample Capacity Chart ONLY ! Do not use this chart, use the one located in your cab.



Approved Attachments

Although the carriage/fork combination is most frequently used, several other GRADALL-approved attachments are available for use with your material handler. Contact your GRADALL Material Handler Distributor or Gradall for information on approved attachments designed to solve special material handling problems.

The serial number plate lists attachments approved for use with your handler. However, there may be additional approved attachments available. Contact your GRADALL Material Handler Distributor for further information.

Non-Approved Attachments

Do not use non-approved attachments for the following reasons:

- GRADALL cannot establish range and capacity limitations for "will fit", homemade, altered, or other non-approved attachments.
- An overextended or overloaded handler can tip over with little or no warning and cause serious injury or death to the operator and/or those working near the handler.
- GRADALL cannot assure the ability of a non-approved attachment to perform its intended function safely.
- Non-approved attachments may cause structural or other damage to the handler. Such damage could cause dangerous operating conditions resulting in serious injury or death.

⚠ WARNING

Attachments which have not been approved for use with your handler could cause machine damage or an accident resulting in injury or death.

Carriage/Fork Capacities

The standard carriage/fork capacity chart (located on the dashboard) indicates maximum reach and load capacities for handlers equipped with an approved carriage/fork combination. **These limitations apply to standard, GRADALL-approved carriage/fork combinations, except as stated on the capacity chart.**

Non-standard carriage/fork combinations (greater or lesser capacity) may be furnished by GRADALL at customer's request or may be available for installation because they were furnished for a different application.

If a carriage/fork combination of lesser capacity is used, **the overall machine capacity is reduced** to carriage/fork capacity as indicated on carriage/fork serial number plate.

If a carriage/fork combination of greater capacity is used, the overall machine capacity may be reduced because of additional attachment weight and/or other considerations. **Contact your local GRADALL Distributor to determine capacity limitations.**

⚠ CAUTION

The capacity of forklift, attachment and fork combination may be less than the capacity shown on attachment. Consult forklift nameplate and also ensure forks are of proper size.

Forks rated less than the attachment capacity decrease capacity of attachment to that of forks. Forks rated more than attachment capacity do not increase attachment capacity.

Other Attachment Capacities

A serial number/capacity plate is attached to all GRADALL-furnished attachments. **Do not assume that any GRADALL attachment may be used on any GRADALL Material Handler.**

First, check the listing of approved attachments on handler serial number plate. If the attachment in question is not included in the list, contact your local GRADALL Distributor to check whether or not the attachment is approved.

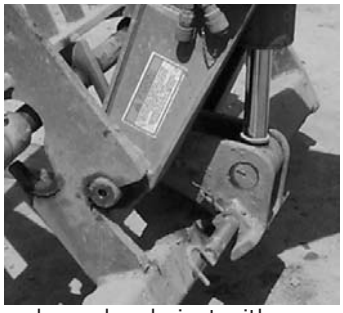
Next, **if the attachment is approved for use** with your handler, compare maximum capacity from attachment serial number plate and value stamped on forks to maximum capacity for that **attachment** as indicated on material handler serial number plate. **The smallest of these values is correct for your handler.**

⚠ WARNING

Never use an attachment without the appropriate, GRADALL supplied capacity chart for that particular attachment installed on the handler.

Attachment Installation

1. Retract Quick Switch™ (attachment tilt lever forward) to provide clearance. Check to be sure lock pin is secured in out position with retainer pin.



2. Align boom head pivot with recess in attachment. Raise boom slightly to engage boom head pivot in recess.

3. Engage Quick Switch™ (attachment tilt lever backward).

4. Remove retainer pin and slide lock pin in fully.

5. Secure lock pin in locked position using retainer pin.

6. If attachment is equipped, swing saddles down and pin in place.

⚠ WARNING

This installation procedure is designed for one-man operation. If a helper is involved, shut off the engine before proceeding to steps 4 and 5.

⚠ WARNING

Always be certain that carriage or attachment is properly positioned on boom head and is secured by lock pin and retainer pin. Failure to ensure proper installation could permit carriage/attachment/load to disengage and cause serious injury or death.

Attachment Operation

Operation of the handler equipped with carriage/fork combination is covered in the **GRADALL Material Handler Safety Manual and this Manual.**

Operation of the handler when equipped with other approved attachments is covered in this section or in separate instructions furnished with the attachment. Any separate instructions must be kept in Manual Holder in cab with this **Owner/Operator Manual,** an additional copy must be kept with the attachment if it is equipped with a manual holder.

Take extra care when engaging, securing, manipulating, transporting and positioning the load.

Operate a handler equipped with an attachment as a partially-loaded handler. Pay special attention to capacity and range limits for the handler/attachment combination.

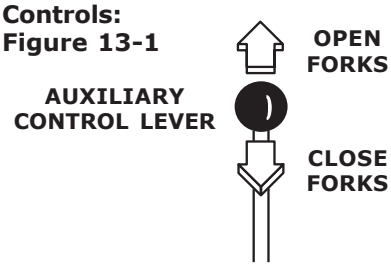
Practice operation of handler and attachment in a safe, open area, not hazardous to yourself, other persons, equipment or property. Become thoroughly familiar with response of handler and attachment to controls before operating in a work situation.

Always consider terrain between present location of load and delivery point. Never attempt to transport a load across terrain which could cause handler to tip over.

Fork Positioner

Capacity:
Maximum load capacity for fork positioner carriage is the same as standard carriage without fork positioner. **Refer to Attachment Capacity Chart.** Capacity varies with boom extension and elevation positions.

Controls:
Figure 13-1



The auxiliary control lever is used to adjust fork position. Pull lever back to close forks, push lever forward to open forks.

Installation Procedure:
1. Remove standard carriage/fork combination or other attachment from boom head. See ***"Attachment Installation" page 13.1***.
2. Install carriage/fork combination with positioner.
3. Connect auxiliary hydraulic hoses to positioner cylinders.

Operation:
- Always adjust fork position before engaging load. Moving forks after engaging load could cause load to fall from forks.

WARNING

PRECAUTIONS
- *Always adjust fork position before engaging load.*
- *As with all other attachments, handler must be level before handling a load more than 1.2m (four feet) above ground level.* ***See "Leveling The Handler," page 11.0.***

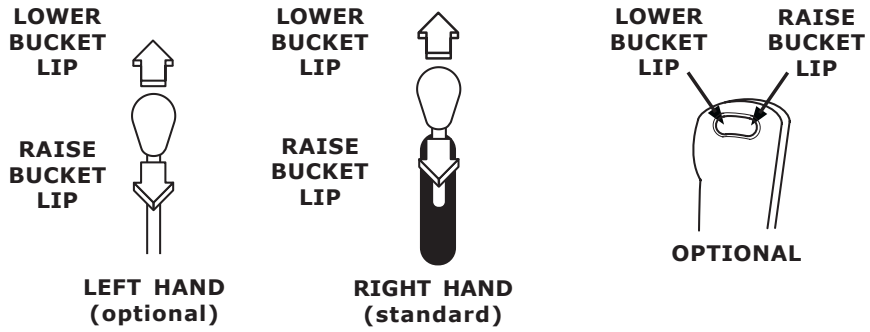
WARNING

Observe all precautions and load capacity limits (listed previously) when handling loads with carriage/fork positioner.

Light Material Bucket

Capacity:
Maximum capacity of light material bucket is shown on the attachment serial number plate and may be used in areas where it does not exceed capacities shown on standard carriage/fork capacity chart. Capacity must be reduced for areas where maximum bucket capacity would exceed standard carriage/fork capacity chart.

Attachment Tilt Controls:
Figure 13-2



Because the carriage tilt cylinder is used to tilt the bucket, the carriage tilt lever is used to control the bucket. Pull lever back to raise bucket lip push lever forward to lower bucket lip.

Installation Procedure:
1. Remove carriage/fork combination or other attachment from boom head. ***See page 13.1***.
2. Install light material bucket on boom head.
3. Retract boom fully and tilt bucket up or down as required to position bottom of bucket parallel with ground.

WARNING

PRECAUTIONS
- *Handler must be level before handling a load more than 1.2m (four feet) above ground level.* ***See page 11.0***.
- *Retract boom fully before loading bucket. Loading bucket with boom extended could damage structural members or extension chains/cables.*
- *Avoid shock loads; drive into stockpile smoothly to load bucket.*
- *Do not use bucket as a lever to pry heavy material. Excessive prying forces could damage the bucket.*
- *Do not use bucket for "back dragging." This could cause severe damage to Quick Switch fittings.*

WARNING

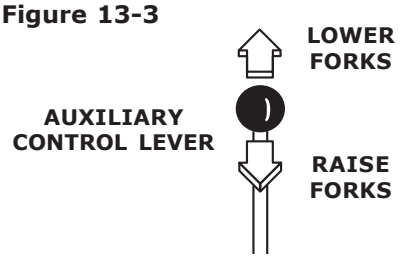
Observe all precautions and load capacity limits (listed previously) when handling loads with light material bucket.

Operation:
- Raise or lower boom to appropriate height for loading material from stockpile.
- Align handler with face of stockpile and drive slowly and smoothly into pile to load bucket. Do not corner-load bucket.
- Tilt bucket up far enough to retain load and back away from pile.
- Lower bucket to carry position 1.2m (4 feet) or less above ground and travel carefully to unloading point. Turn bucket down to dump load.

Mast (1.8m [6'] with 1.2m [4’] or 1.8m [6’] carriage)

Capacity:
Maximum lift capacity (indicated on attachment serial number plate) applies only to certain areas within boom extension/elevation pattern of handler/mast combination. A separate capacity chart must be used for handlers equipped with mast. Study and understand this chart before attempting to handle a load with mast attachment.

Attachment Tilt Controls:
Figure 13-3



The carriage tilt cylinder is used to tilt the mast and the carriage tilt lever controls mast tilt. The auxiliary control lever is used to raise and lower the forks in the mast. Pull lever back to raise forks; push lever forward to lower forks.

Installation Procedure:
1. Remove carriage/fork combination or other attachment from boom head. ***See page 13.1.***
2. Install mast on boom head.
3. Connect auxiliary hydraulic hoses to mast cylinder.

Operation:
- Always level handler before raising the boom or the forks, with or without a load.
- To travel with a load, lower forks fully in mast and lower boom to position load 1.2m (4 feet) or less above ground, allowing for best visibility.
- Use mast as required to increase vertical reach of handler.
- Use a signal man to assist in positioning the load if necessary.

⚠ WARNING

PRECAUTIONS
- *Read additional capacity information under “Capacity” heading.*
- *Because the mast increases lift height, it isespecially important to level the handler before lifting a load more than 1.2m (four feet) above ground.* ***See page 11.0.***

⚠ WARNING

Do not handle a load with Mast attachment until you study and understand the “Mast Capacity Chart.” If your handler does not have a “Mast Capacity Chart,” ask your supervisor to get one before using the attachment.

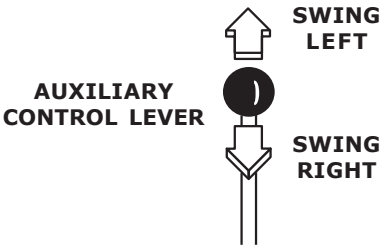
Swing Forks

Capacity:
Maximum lift capacity for swing forks is shown on the attachment capacity chart. However, maximum lift capacity applies only to certain areas within boom extension/elevation pattern of handler/swing forks combination. A separate capacity chart must be used for handlers equipped with swing forks. Study and understand this chart before attempting to handle a load with swing forks attachment.

⚠ WARNING

Do not handle a load with Swing Forks attachment until you study and understand the “Swing Forks Capacity Chart.” If your handler does not have a “Swing Forks Capacity Chart,” ask your supervisor to get one before using the attachment.

Attachment Tilt Controls:
Figure 13-4



The carriage tilt cylinder is used to tilt the swing forks up and down and the carriage tilt lever controls fork tilt.

The auxiliary control lever is used to swing the forks to the left and right. Pull lever back to swing forks right; push lever forward to swing forks left.

Installation Procedure:
1. Remove carriage/fork combination or other attachment from boom head. ***See page 13.1.***

2. Install swing forks attachment on boom head.

3. Connect auxiliary hydraulic hoses to swing forks attachment.

Operation:
- Always position forks straight ahead before engaging load.
- To travel with load, keep forks in straight ahead position and lower load to 1.2m (4 feet) or less above ground allowing for best visibility.
- Inspect supporting surface at delivery point and have it leveled if necessary.
- Use a signal man to assist in positioning the load if necessary.

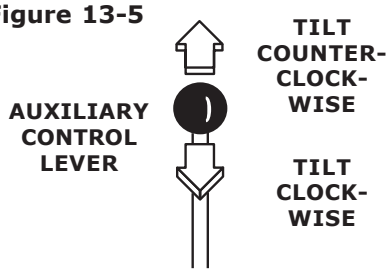
WARNING

PRECAUTIONS
- *Read and understand additional capacity information under "Capacity" heading.*
- *Always level forks (horizontally) before swinging load to side. Swinging unlevel forks could result in load slipping from forks.*
- *Because the swing forks can swing the load to the side, it is especially important that the handler be level when handling a load more than 1.2m (four feet) above ground.* ***See page 11.0.***

Slope Piler Carriage

Capacity:
Maximum lift capacity for the slope piler carriage is shown on the attachment serial number plate. However, maximum lift capacity applies only to certain areas within boom extension/elevation pattern of handler/slope piler carriage combination. A separate capacity chart must be used for handlers equipped with slope piler carriage. Study and understand this chart before attempting to handle a load with slope piler carriage.

Attachment Tilt Controls:
Figure 13-5



The carriage tilt lever controls carriage tilt.

The auxiliary control lever is used to tilt slope piler carriage. Push lever forward to tilt carriage counter-clockwise; pull lever back to tilt clockwise.

Installation Procedure:
1. Remove carriage/fork combination or other attachment from boom head. ***See page 13.1.***

2. Install slope piler carriage on boom head.

Operation:
- Connect auxiliary hydraulic hoses to slope piler carriage attachment.
- Approach load with forks centered on load and stop handler.
- Level handler before tilting carriage to engage load.

WARNING

PRECAUTIONS
- *Level handler before tilting carriage to engage load.*
- *Always level handler before lifting a load more than 1.2m (four feet) above ground.* ***See page 11.0.***

WARNING

Do not handle a load with Slope Piler Carriage attachment until you study and understand the "Slope Piler Carriage Capacity Chart." If your handler does not have a "Slope Piler Carriage Capacity Chart," ask your supervisor to get one before using the attachment.

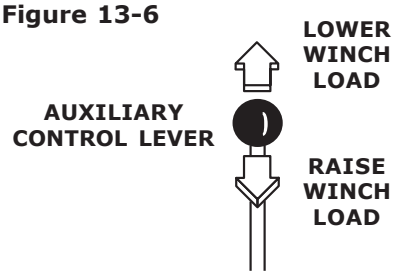
- Tilt carriage to left or right to align forks with load and engage load.
- Raise load slightly and then level carriage.
- Travel with load lowered to travel position 1.2m (4 feet) or less above ground.

Boom Head-Mounted Winch

Capacity:
The boom head-mounted winch maximum load capacity is shown on the standard carriage capacity chart. However, maximum capacity may be used only in areas where it does not exceed capacities shown on standard carriage/fork capacity chart (located on dashboard). Also note that maximum winch capacity is less than carriage/fork maximum capacity. Capacity rating is based on load being lifted and suspended vertically from the boom and with no load on forks.

Observe the following Special Precautions:
- Never drag the load; lift vertically.
- Use tag line to guide and steady a suspended load. Tag lines must be long enough to keep helpers clear of load and handler.
- Beware of wind. Wind can cause a suspended load to swing and cause dangerous side loads - even with tag lines.
- Start, travel, turn and stop slowly to prevent load from swinging.
- Weight of all rigging (slings, etc.) must be included as part of load.
- Do not attempt to use handler frame-leveling to compensate for load swing.

Attachment Tilt Controls:
Figure 13-6



The auxiliary control lever is used to control the boom head-mounted winch. Pull the lever back to raise winch load; push the lever forward to lower winch load.

Installation Procedure:
1. Install winch on boom head and connect hydraulic hoses at winch motor.
2. Position winch hook directly above balance point of load and secure using appropriate rigging.

Operation:
- Attach tag lines to load and transport load to delivery site.
- While helpers guide load with tag lines, position load at delivery point.

WARNING

A side load or a swinging load could cause the handler to tip over and/or damage the boom.

WARNING

PRECAUTIONS
- *Maximum winch load capacity is reduced from normal carriage/fork load rating.*
- *Always level handler before lifting a load.* ***See page 11.0.***
- *Travel with load and boom lowered to travel position, 1.2m (4 feet) or less above the ground.*
- *Always lower load to rest before leaving handler.*

WARNING

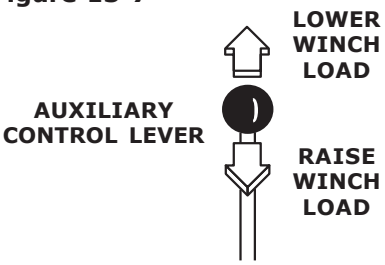
Do not handle a load with Boom Head-Mounted Winch attachment until you study and understand the "Boom Head-Mounted Winch Capacity Chart" carefully. If your handler does not have a " Boom Head-Mounted Winch Capacity Chart," ask your supervisor to get one before using the attachment.

Truss Boom & Truss Boom with Winch

Capacity:
Maximum capacity for the truss boom (with or without winch) is shown on attachment serial number plate. However, maximum lift capacity applies only to certain areas within boom extension/elevation pattern of handler/truss boom combination. A separate capacity chart must be used for handlers equipped with truss boom. Study and understand this chart before attempting to handle a load with truss boom.

Observe the following Special Precautions:
- Never drag the load; lift vertically.
- Use tag line to guide and steady a suspended load. Tag lines must be long enough to keep helpers clear of load and handler.
- Beware of wind. Wind can cause a suspended load to swing and cause dangerous side loads - even with tag lines.
- Start, travel, turn, and stop slowly to prevent load from swinging.
- Weight of all rigging (slings, etc.) must be included as part of load.
- Do not attempt to use handler frame-leveling to compensate for load swing.

Attachment Tilt Controls:
Figure 13-7



The carriage tilt cylinder is used to tilt the truss boom up and down from the handler boom head. The carriage tilt lever controls truss boom tilt.

The auxiliary control lever is used when the truss boom is furnished with a winch. Pull the lever back to raise winch load; push the lever forward to lower winch load.

Installation Procedure:
1. Remove carriage/fork combination or other attachment from boom head. ***See page 13.1.***
2. Install truss boom on boom head.

Operation:
- If truss boom winch is furnished, connect auxiliary hydraulic hoses to winch.
- Approach truss or truss bundle with boom above and parallel to load.
- Position truss boom approximately parallel with main boom.
- Position truss boom/winch hook as close as possible to balance point of load and secure load to boom using short slings or other rigging. Be sure rigging will not allow load to slip in any direction.

⚠ WARNING

PRECAUTIONS
- *Because the truss boom extends the reach of the handler, maximum load capacity is reduced.*
- *Because of extended reach, it is especially important to level the handler before lifting a load.* ***See page 11.0.***
- *Travel with load and boom lowered to travel position 1.2m (4 feet) or less above ground.*
- *Always lower load to rest before leaving handler.*

⚠ WARNING

Do not handle a load with Truss Boom & Truss Boom with Winch attachment until you study and understand the "Truss Boom & Truss Boom with Winch Capacity Chart." If your handler does not have a "Truss Boom & Truss Boom with Winch Capacity Chart," ask your supervisor to get one before using the attachment.

⚠ WARNING

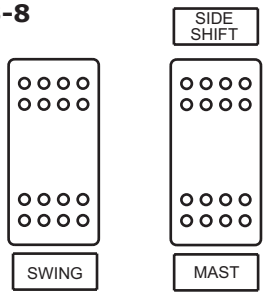
A side load or a swinging load could cause the handler to tip over and/or damage the boom.

- Open clamps at heel of truss boom far enough to clear load and tilt truss boom up until truss/bundle contacts heel of truss boom.
- Close clamps to hold load lightly and secure clamps.
- Transport load to delivery site and attach tag lines if load will be freely suspended.

Swing Mast

Capacity:
Maximum lift capacity is shown on attachment serial number plate. However, maximum lift capacity applies only to certain areas within boom extension/ elevation pattern of handler/swing mast combination. A separate capacity chart must be used for handlers equipped with mast. Study and understand this chart before attempting to handle a load with swing mast attachment.

Controls:
Figure 13-8



The carriage tilt cylinder is used to tilt the mast and the carriage. Tilt lever controls mast tilt.

- Press right switch up to "SIDE SHIFT" to activate side shift function. Move auxiliary hydraulic lever in appropriate direction.
- Press left switch down to "SWING" to activate swing function. Move auxiliary lever in appropriate direction.
- Press right switch down to "MAST" to activate mast function. Move auxiliary lever in appropriate direction.

Installation Procedure:
1. Remove carriage/fork combination or other attachment from boom head. **See page 13.1.**
2. Install swing mast on boom head and connect auxiliary hydraulic hoses to swing mast diversion valve hoses. Also connect electrical cable at boom head.

Operation:
- Always lower carriage fully in mast and position forks straight ahead before engaging load.
- To travel with a load, keep forks straight ahead and lower load to travel position 1.2m (4 feet) or less above ground.
- Inspect supporting surface at delivery point and have it leveled if necessary.
- Level handler before raising load.
- If necessary, perform a "dry-run" (unloaded) of delivery to determine best position for handler.
- Use a signal person to assist in positioning the load if necessary.

⚠ WARNING

PRECAUTIONS
- *Always level forks (horizontally) before swinging load to side. Swinging unlevel forks could result in load slipping from forks.*
- *The swing mast attachment has a smaller load capacity than the standard carriage/ fork attach. Study and understand the swing mast capacity chart before handling a load with swing mast.*
- *Read additional capacity information under "Capacity" heading on chart.*
- *Because the swing mast increases lift height and can swing load to side; it is especially important to level handler before lifting a load more than 1.2m (four feet) above ground level.* ***See page 11.0.***

⚠ WARNING

Do not handle a load with Swing Mast attachment until you study and understand the "Swing Mast Capacity Chart." If your handler does not have a "Swing Mast Capacity Chart," ask your supervisor to get one before using the attachment.

⚠ WARNING

Observe all precautions and load capacity limits when handling loads.

Personnel Work Platform

The material handler operator and personnel in the platform must read and understand the separate personnel work platform manual, included with the attachment, prior to using the platform.

Capacity:
The Gradall personnel work platform is designed to carry a maximum of 3 occupants. The load includes personnel, materials, tools, etc. The maximum capacity of your work platform is based on specific model material handler/ work platform combination. To determine maximum load capacity for given operating ranges, consult the proper load capacity chart (furnished with platform) for the material handler and work platform in use. **If your handler is not equipped with the proper personnel work platform capacity chart, get one before using the attachment.**

Installation Procedure:
1. Remove carriage/fork combination or other attachment from boom head. ***See page 13.1.***

Operation:
- Gradall Personnel Work Platforms are approved for use **only** on Gradall Material Handlers equipped with the proper platform capacity chart.
- When lifting personnel, **use only a Gradall manufactured personnel work platform**. No other platform is approved for use on Gradall Material Handlers.

⚠ WARNING

Do not use the Personnel Work Platform until you study & understand the " Capacity Chart". If your handler does not have the correct "Personnel Work Platform Capacity Chart", ask your supervisor to get one before using the attachment.

⚠ WARNING

Do not use a boom mounted winch while the platform is mounted to the boom.

1. Operate unit until hydraulic oil reaches normal operating temperature.

2. Apply parking brake, lower boom to rest and shift Forward/Reverse lever to "Neutral" Observe Hydraulic Filter Bypass Indicator with engine running at full throttle. Replace filter elements if necessary.

3. Obtain a container to receive waste oil and a **CLEAN** container to receive oil sample.

4. With gauge removed from hose, attach mini-check and hose to test port located above priority valve. **(See figure 14-1)** Hose end must be positioned in waste oil container.

5. Allow at least one pint of oil to flow into waste oil container to eliminate any contamination from hose.

6. Move hose to **CLEAN** container to collect sample for analysis.

7. Return hose to waste oil container and disconnect adapter from mini-check test port.

8. Cover sample container immediately with **CLEAN** cap.

9. Stop engine and check oil level in reservoir and replenish as required. For ease of filling reservoir, use a funnel with a hose or flexible tube for best results.

10. Contact your GRADALL Distributor for information concerning oil analysis.

Oil sample containers are available from several sources:

- Oil companies
- Oil suppliers
- Sampling labs

NOTE!

OIL CLEANLINESS IS CRITICAL The filtration system is designed to maintain a minimum ISO cleanliness level of 18/15.

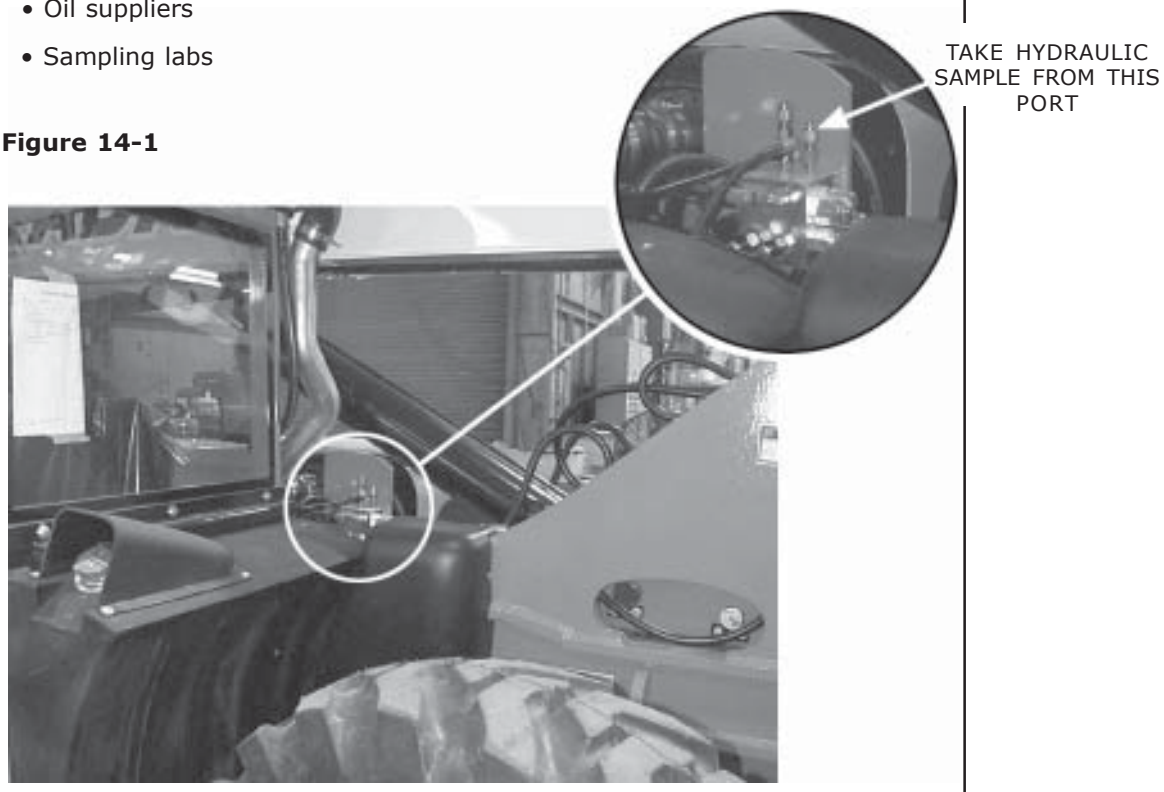


Figure 14-1

LOADING & SECURING FOR TRANSPORT

Loading & Securing Handler For Transport

1. Level the material handler prior to loading.
2. Using a spotter, load the handler with boom as low as possible to keep a low center of gravity.
3. Once loaded, apply parking brake and lower boom until boom or attachment is resting on deck. Move all controls to "Neutral", stop engine and remove ignition key.
4. Secure machine to deck by passing chains through four tie-down lugs on front and rear of machine. **(See figures 15-1 & 15-2)**
5. Do not tie down front of boom.

WARNING

Before loading handler for transport, make sure deck, ramps and handler wheels are free of mud, snow and ice. Failure to do so could cause handler to slide, resulting in an accident causing serious injury or death.

Figure 15-1 (front view)

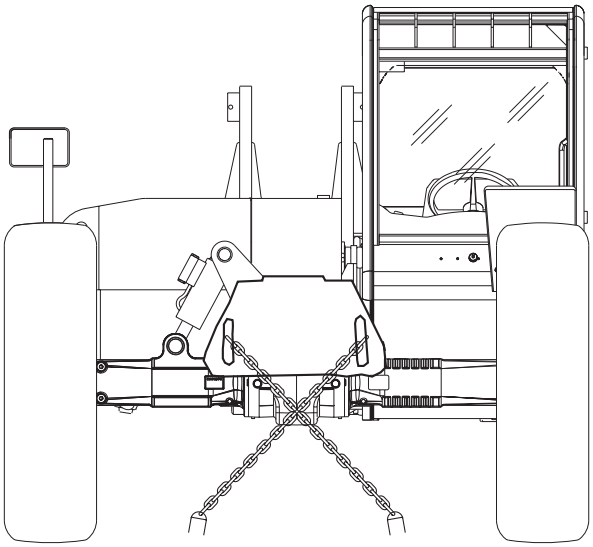
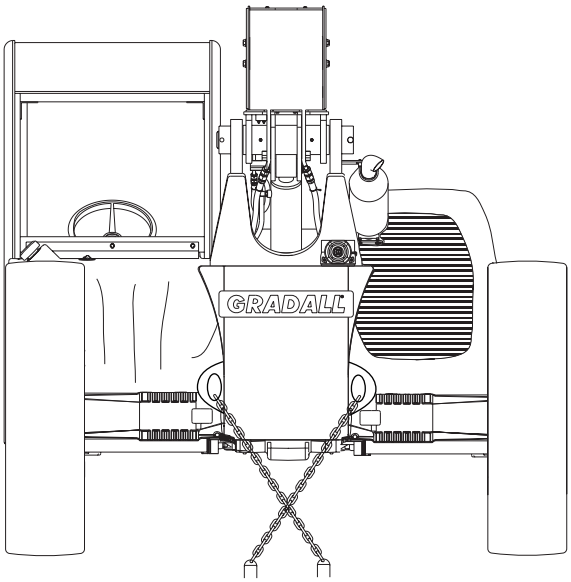


Figure 15 -2 (rear view)



The following information assumes the handler cannot be moved under its own power.

Before moving the handler, read all of the following information to understand options available. Then select the appropriate method.

The steering system permits manual steering if engine or power assist feature fails.

Remember:
- Although manual steering is possible without power assist, **steering will be slow and will require much greater force.**

- Response to manual steering will be increased if parking brake is released and front axle drive is bypassed, permitting front wheels to roll.

MOVING SHORT DISTANCES

If it is only necessary to move handler a short distance less than 30m (100 feet), it is permissible to use a vehicle of sufficient capacity to tow the unit with no previous preparation. Drive wheels will not roll. If the unit must be moved more than 30m (100 feet), but less than 182m (200 yards), it is permissible to use a vehicle of sufficient capacity to tow unit after you:

- Release parking brake. ***See pages 16.1 & 16.2.***

MOVING LONGER DISTANCES

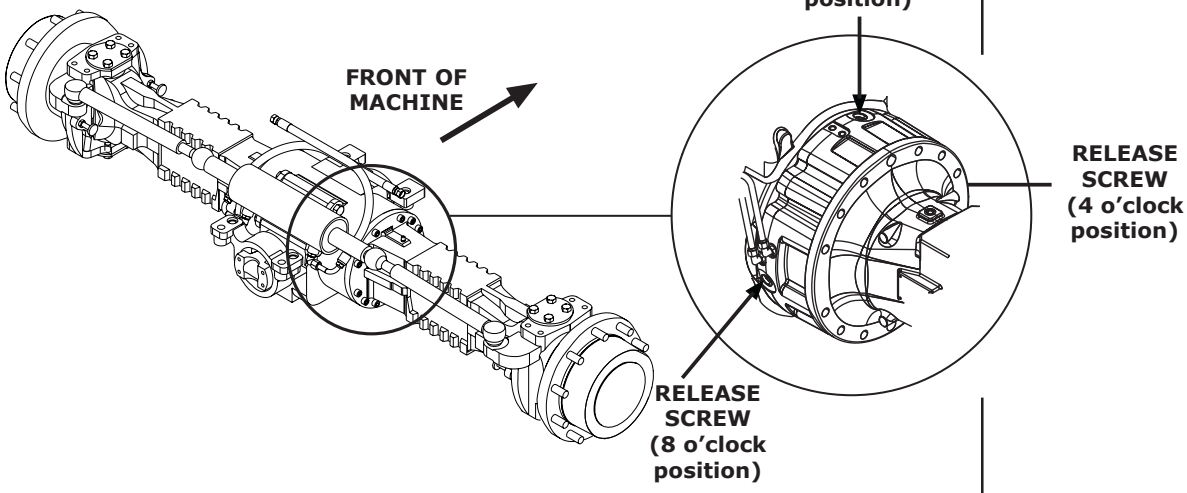
If the handler must be moved more than 182m (200 yards), it must be loaded on to a trailer of sufficient capacity.

TO RELEASE PARKING BRAKE CARRARO AXLE

1. If possible position unit on level ground, lower attachment to approximately .3m (one foot) from ground, move forward/reverse lever to "Neutral", apply parking brake and stop engine.

2. Block all wheels to prevent inadvertent movement.

Figure 16-1



3. Working one side at a time, remove three plugs from differential housing (located at 12 o'clock, 4 o'clock and 8 o'clock). Put plugs aside.

5. Tighten each release screw revealed by the plugs, lightly until it just makes contact with guide pin.

6. Working carefully, tighten each release screw only 1/4 turn (90°) at a time, in sequence, until all three screws have been turned one full turn 360° approximately 67 n.m (50 ft.-lb.). Larger turns could cause components to bind and cause brake failure.

7. Repeat this procedure on other side of differential. Parking brake should be released.

TO RESTORE PARKING BRAKE

Make certain engine is stopped and all wheels are blocked.

Loosen each release screw, only 1/4 turn at a time, in sequence, until each screw has lost contact with guide pin. Then back out each screw until it bottoms out against the stop. Install plugs over each release screw.

Repeat procedure on other side of differential. Parking brake should be restored to operation.

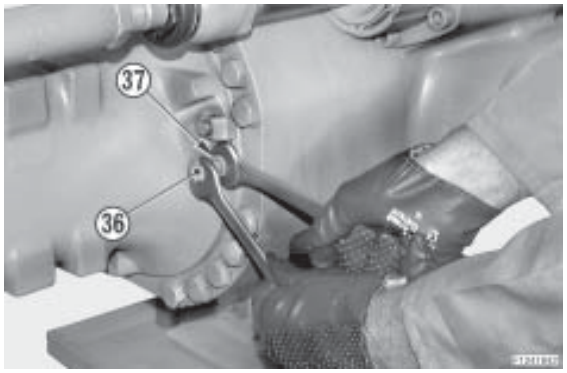
⚠ WARNING

If you release the park brake without first blocking the wheels, the material handler could roll. Block all wheels before releasing park brake.

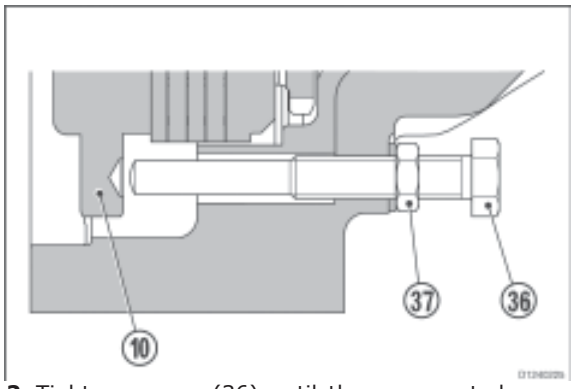
DANA AXLE

Figure 16-2

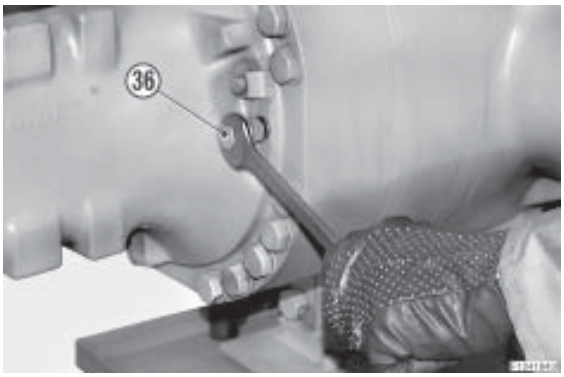
AXLE MANUAL RELEASE (steps 1-3)
Block wheels before performing this procedure.



1. Loosen the nuts (37) of the screws (36) for the manual release of the braking units. Draw the nuts back about 6mm.



2. Tighten screws (36) until they are seated on the driving plate (10).

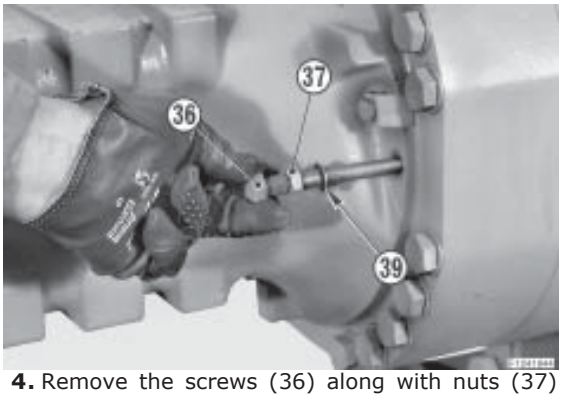


3. Using a wrench, tighten two screws (36) in an alternate manner by 1/4 turn at a time in order to compress the Belleville washer (24) and release the braking discs. The stroke required for brake release corresponds to 1 turn. **Attention!** Do not exceed this value.

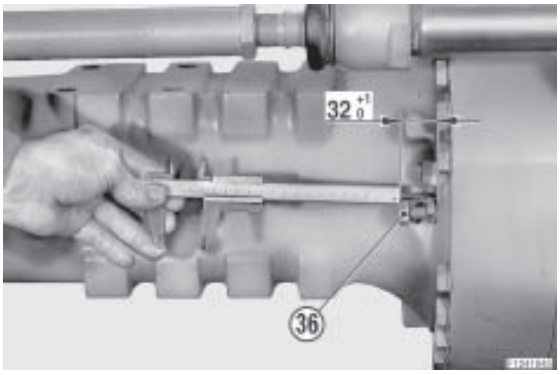
WARNING

The front axle service brakes will not operate when the park brakes are manually disengaged. The rear brakes may only provide half of the machine's normal braking capability. Always reset the brake release screws before allowing machine back in to regular service.

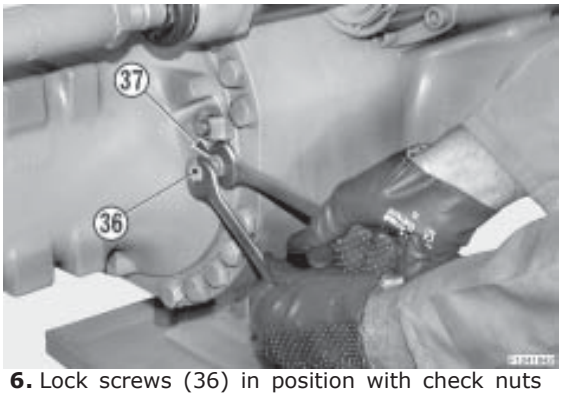
ADJUSTMENTS AFTER MANUAL RELEASE (steps 4-6)



4. Remove the screws (36) along with nuts (37) and seals. Replace seals (39), lubricate screws (36) with silicone-based TECNO LUBE 101 grease and re-install the screws along with the nuts.



5. Adjust jut of screw heads (36) in relation to the arm by 32 $^{+1}_{0}$ mm.



6. Lock screws (36) in position with check nuts (37). **Attention!** Check screw jut over with maximum care.

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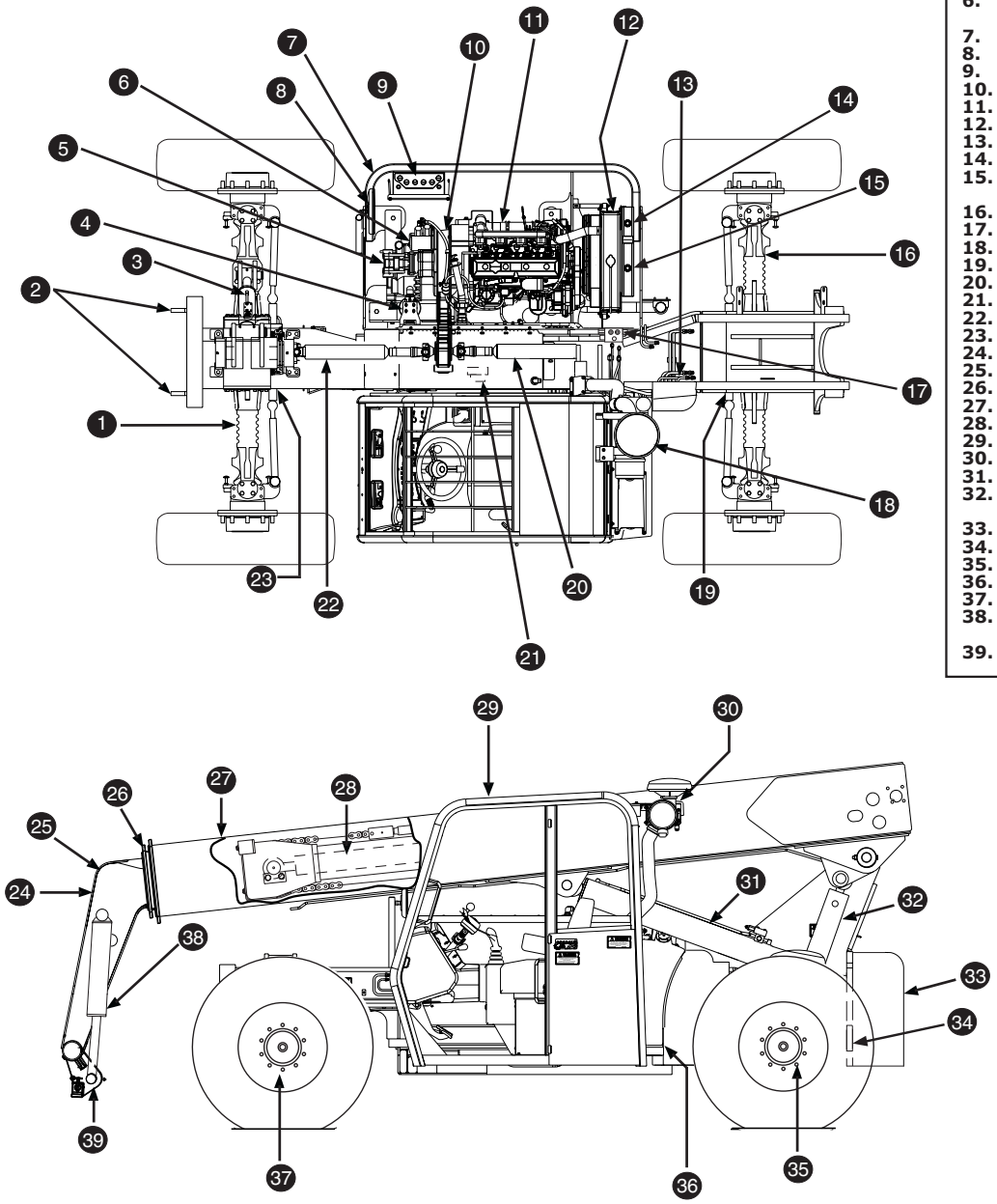
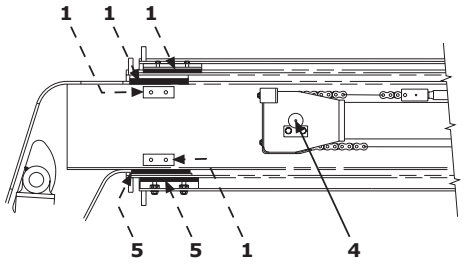
NOMENCLATURE

Figure 17-1



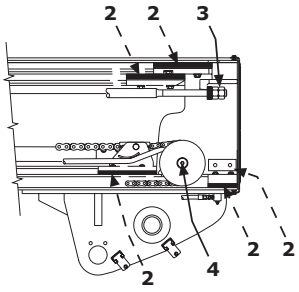
1.	FRONT AXLE
2.	TIE-DOWN LUGS
3.	SWAY CYLINDER
4.	HYDRAULIC TANK & FILTER
5.	IMPLEMENT PUMP
6.	TRANSMISSION OIL FILTER
7.	ENGINE COMPARTMENT
8.	MIRROR
9.	BATTERY
10.	TRANSMISSION
11.	ENGINE
12.	RADIATOR
13.	CONTROL VALVE
14.	HYDRAULIC OIL COOLER
15.	TRANSMISSION OIL COOLER
16.	REAR AXLE
17.	PRIORITY VALVE
18.	AIR CLEANER
19.	STEERING CYLINDER
20.	REAR DRIVE SHAFT
21.	STEER SELECT VALVE
22.	FRONT DRIVE SHAFT
23.	STEERING CYLINDER
24.	BOOM HEAD
25.	THIRD BOOM SECTION
26.	SECOND BOOM SECTION
27.	FIRST BOOM SECTION
28.	CROWD CYLINDER
29.	OPERATOR'S CAB
30.	AIR CLEANER
31.	LIFT CYLINDER
32.	COMPENSATION CYLINDER
33.	COUNTERWEIGHT
34.	TIE-DOWN LUGS
35.	REAR LUG NUTS
36.	FUEL TANK
37.	FRONT LUG NUTS
38.	ATTACHMENT TILT CYLINDER
39.	QUICKSWITCH™

LUBRICATION & ROUTINE MAINTENANCE



Lubrication Symbols

DF - DIESEL FUEL
EO - ENGINE FUEL
HF - HYDRAULIC FLUID
HM - MOLY LUBE (extreme pressure)



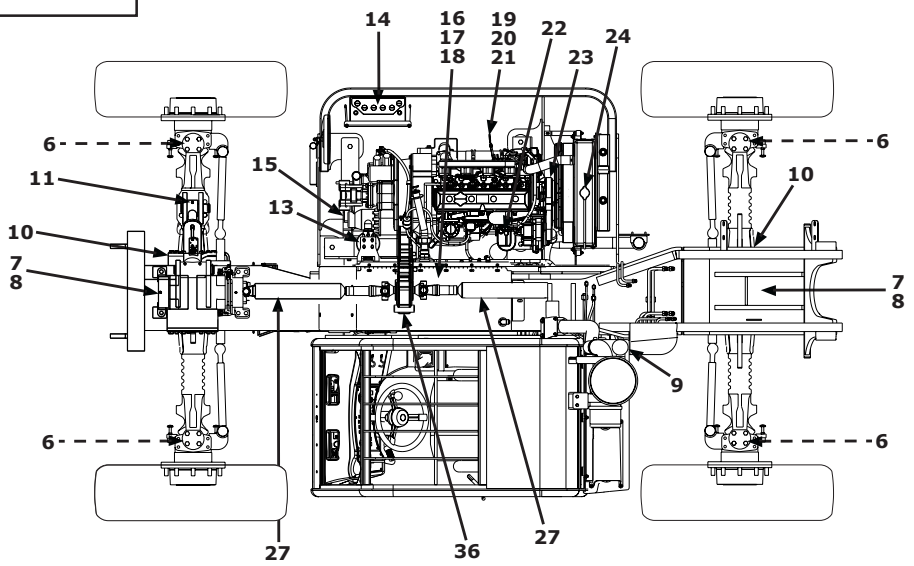
IMPORTANT NOTICE

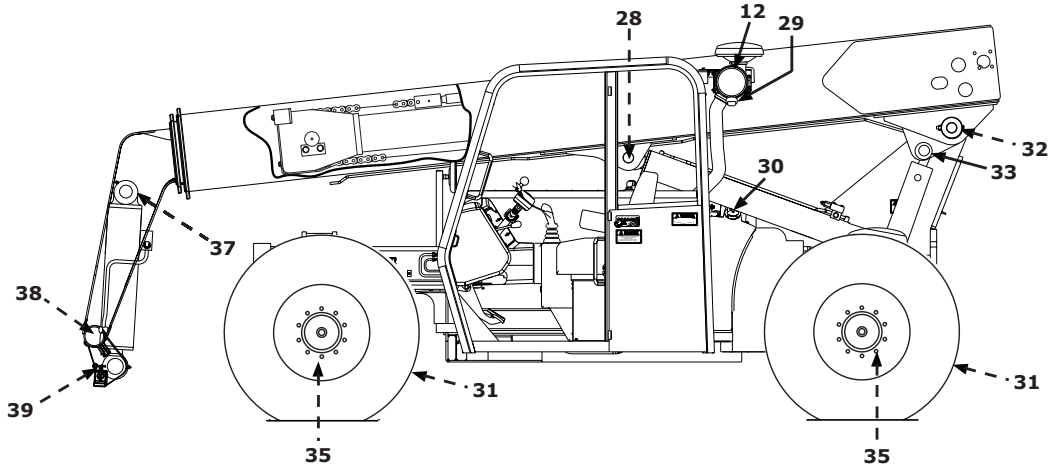
Be certain to check extend chain adjustment every 5 weeks or 250 hours and adjust as required. Chain damage can occur if chain is not adjusted properly.

FAILURE TO USE GRADALL HYDRAULIC FILTER ELEMENTS COULD VOID WARRANTY

SYMBOLS

● = Lube Fitting
→ = Other Service
— — = Service Both Sides





LUBRICATION NOTICE

- After greasing machine, cycle all functions several times to distribute lubricants. Perform this maintenance procedure without attachment or forks installed.
- Apply a light coating of engine oil to all linkage pivot points.
- Clean lubrication fittings before lubricating.
- Intervals shown are for normal (8-hour day) usage and conditions. Adjust intervals for abnormal usage and conditions.
- Drain engine and gear cases after operating when oil is hot.
- Check lubricant levels when lubricant is cool. For ease of filling hydraulic reservoir, use a funnel with a hose or flexible tube for best results.
- Clean filter and air cleaner housing and reusable elements using solvent or diesel fuel. Dry components thoroughly using lint free cloth.

CAUTION

Service intervals are based on machine usage of 1500 hours annually. Use of your unit may vary significantly and you must adjust service frequency for your usage to obtain maximum service life. Frequency headings in the following schedule indicate a calender limit and an operating hour limit. Perform service at whichever interval occurs first.

	Lube Symbol	No. of Points
Daily or Shift (10 hour Maximum) Lubrication & Maintenance		
12. Air Cleaner Element Condition Indicator (check for clogged condition (red band showing) and clean or replace element as required)	-	1
13. Hydraulic Return Filter Condition Indicator (check indicator with oil at normal operating temperature and engine running at full throttle - replace filter element before by-pass indication is reached or at least annually)	-	1
15. Transmission Fluid Level	HF	1
18. Hydraulic Level Sight Gauges (level handler, retract all other cylinders and check sight gauges - refill as required)	HF	1
19. Engine Crankcase Dipstick (level handler and check fluid level - refill as required	EO	1
30. Fuel Filler Cap (fill at end of work shift to minimize condensation)	DF	1
Weekly (or 50 Hour) Lubrication & Maintenance (include all previous periodic services)		
4. Extend/Retract Chain Sheaves	HM	3
5. Boom Bottom, Front Slide Bearings (extend boom fully and lube all wear paths - retract and extend boom fully three times and wipe excess lube from bearings)	HM	4
11. Sway Cylinder Pivots	HM	2
14. Battery (check terminals)	-	1
22. Fuel Filter/Water Separator (with Drain) (replace element)	-	1
24. Radiator Fill Cap (check level and refill as required - refer to John Deere Manual for coolant conditioner ratio)	-	1
28. Boom Lift Cylinder Pivots	H M	2
31. Tires (check for damage and proper inflation) 13.00 x 24, 12 ply - 445 kpa (65 psi) 13R24, 12 Ply - 482 kpa (70 psi) 15.5-25, 12 Ply - 400 kpa (58 psi)	-	4
32. Boom Pivots	H M	2
33. Compensating Cylinder Pivots	H M	2
37. Carriage Tilt Cylinder Pivots	H M	2
38. Boom Head/Carriage Pivot	H M	2
39. Quick Switch Latch	H M	1
At End of First 50 Hours Only		
10. Differential Drain Plug (drain and refill)	HF	2
20. Special engine break-in oil (drain & refill) (replace filter)	EO	1
35. Planetary Drain Plugs (drain while draining differential)	HF	4
15. Transmission Oil & Filter (drain & refill) (replace filter)	HF	1
At End of First 30 Days Only (250 Hours Maximum) Lubrication & Maintenance		
• Check torque of all items listed in **Torque Chart** (pg 17.3)		

	Lube Symbol	No. of Points
5 Week (or 250 Hour) Lubrication & Maintenance (include all previous periodic services)		
1. Boom Front Top and Side Slide Bearings (extend boom fully and lube all wear paths - retract and extend boom fully three times and wipe excess lube from bearings)	HM	12
2. Boom Rear Slide Bearings (lube paths)	HM	12
3. Boom Extend Chain (check adjustment and adjust as required)	-	2
5. Boom Front Bottom Slide Bearings (to be performed by experienced maintenance person - check for damage and excessive wear - no wear permitted past bevel - maximum clearance at top bearings is 3mm (1/8 inch), shim or replace as required; when these bearings require service, check all other slide bearings - shims are 1.5mm (1/16 inch) thick	-	4
6. Axle Kingpins	H M	8
7. Axle Level Plug (check level and refill as required)	HF	2
8. Axle Trunnions	HM	4
20. Engine Crankcase Filler Cap (drain oil and refill top level)	EO	1
21. Engine Oil Filter (replace filter element)	-	1
23. Drive belts (check condition - replace as required)	-	1
27. Drive Shaft Slip Joints	HM	4
29. Vacuator Valve (rubber cone on bottom - check to be sure cone is clear and undamaged)	-	1
35. Planetary Level Plug	HF	4
36. Transfer Case (check and top off)	H F	1
• Check torque of all items listed in Torque Chart (pg 17.3)		
Quarterly (or 500 Hour) Lubrication & Maintenance (include all previous periodic services)		
16. Hydraulic System (we recommend that hydraulic fluid be analyzed to determine condition - drain and refill reservoir if required	HF	1
17. Hydraulic Reservoir Screen (remove, clean, and install when hydraulic oil is drained)	-	1
22. Fuel Filter/Water Separator (with Drain) (replace element)	-	1
Semi-Annual (or 1000 Hour) Lubrication & Maintenance (include all previous periodic services)		
9. Hyd. Tank Filter/Breather (replace)	-	1
10. Axle Drain Plug (drain and refill)	HF	2
15. Transmission Drain Plug (drain, fill to level, replace filter)	HF	1
32. Rear Hub Drain Plug (drain and refill)	HF	2
35. Planetary Drain Plugs (drain while draining differential)	H F	4
36. Transfer Case (drain & refill)		
Annual (or 1500 Hour) Lubrication & Maintenance (include all previous periodic services)		
13. Hydraulic Return Filter (replace filter element)	-	1
16. Hydraulic System (unless fluid is analyzed quarterly to determine degree of contamination, reservoir must be drained and refilled on an annual basis)	HF	1
17. Hydraulic Reservoir Screen (remove, clean, and install when hydraulic oil is drained)	-	1
24. Engine Cooling System (drain, flush and refill on basis of period suggested by anti-freeze manufacturer and add Liquid Coolant Additive refer to John Deere manual for coolant conditioner ratio)	-	1

DETAILED SERVICE INSTRUCTIONS ARE CONTAINED IN THE GRADALL SERVICE MANUAL FOR YOUR PARTICULAR MATERIAL HANDLER

RECOMMENDED LUBRICANTS & CAPACITIES

⚠ CAUTION *When replacing foam filled tires, replace the complete tire and rim assembly.*

APPLICATION	SYMBOL	WHEN USED	GRADE	SPECIFICATION	CAPACITY*	
Boom Chain	CL (chain lube)	All Year	-	P/N 1440-4751	-	-
Boom Bearing Paths	HM (extreme pres. lube)	All Year	NLGI #2	P/N 1440-4595	-	-
Coolant Additive (refer to engine man.)	(SCA supplemental coolant additive)	All Year	-	-	0.5 qts	0.48 L
Transfer Case	HF (hydraulic fluid)	All Year	**	**	0.8 qts	0.8 L
Transmission	HF (hydraulic fluid)	All Year	**	**	16.7 qts	15.8 L
Engine Cooling System	AF (anti-freeze)	All Year	50/50	Permanent	15.5 qts	14.7 L
Engine Crankcase	EO (engine oil)	All Year	15W-40-CD	MIL-L-2104D	14.5 qts	13.8 L
Front/Rear Axle						
Carraro						
Center Section	HF (hydraulic fluid)	All Year	**	**	24.4 pints	11.5 L
Each Wheel End	HF (hydraulic fluid)	All Year	**	**	3.2 pints	1.5 L
Dana						
Center Section	HF (hydraulic fluid)	All Year	**	**	13.0 pints	6.1 L
Each Wheel End	HF (hydraulic fluid)	All Year	**	**	3.4 pints	1.6 L
Fuel Tank	DF (diesel fuel)	All Year	#2	-	38 gal	143.8 L
Grease Fittings	HM (extreme pres. lube)	All Year	NLGI #2	P/N 1440-4595	-	-
Hydraulic System	HF (hydraulic fluid)	All Year	***	***	43 gal	163 L

* Capacities are approximate - check level to be sure.

** Fill to level using **Mobilfluid® 424** (GRADALL P/N 1440-4535)

*** Fill to level using **Mobilfluid® 424** -OR- *Citgo Tractor Hydraulic Fluid* (product code 33310)

TORQUE CHART

To check GRADALL torque values, set the torque wrench at 95% of rated torque value and check fastener. If the torque wrench releases before the fastener moves, assume fastener torque is correct. When setting GRADALL torque values, use the values given on the following chart. Do not exceed allowances.

ITEM	FREQUENCY*	THREAD SIZE (GRADE)	TORQUE (lubricated)			
			FT.-LB.		Nm	
			MINIMUM	MAXIMUM	MINIMUM	MAXIMUM
Boom Slide Bearings (front)	5 Weeks (250 hrs) 5 Weeks (250 hrs)	3/8-24 (5) 1/2-20 (5)	32 68	37 78	43 92	50 106
Boom Slide Bearings (rear)	If front bearings have worked loose	3/8-24 (5) 1/2-20	32 76	37 86	43 103	50 117
Boom Chain Jam Nuts	Annually (1500 hrs)	7/8-14	100	125	136	169
Cab Mounting Bolts (upper) (lower)	Annually (1500 hrs) Annually (1500 hrs)	7/8-9 3/4-10	530 340	565 365	719 461	766 495
Engine Assembly Flywheel Housing Bolts Engine Mounts	 Annually (1500 hrs) Annually (1500 hrs)	 M10 M12 M16	 40 66 166	 45 76 181	 54 89 225	 61 103 245
Front Axle Mounting Bolts	Annually (1500 hrs)	3/4-10	340	365	461	495
Wheel Lug Nuts	3 Months (500 hrs)	-	350 (hand)	400 (hand)	475	543

* Check torque at whichever interval occurs first.

Checking & Adjusting Boom

Boom Bearing Pads

Boom bearing pads are to be adjusted for all boom sections. This should be done at boom assembly, however, some adjustments may be required after assembly.

- Add shims as required so that front and sides of boom have no more than 1.5mm (.06 inch) clearance.
- Add shims as required so that rear of boom has no more than 3.04mm (.12 inch) total clearance.
- Number of shims at each pad may vary, however shims at bottom front pads must not vary more than one shim between sides.
- Pads must not directly contact shims, thus a spacer must be inserted between pad and shims.
- Use Loctite 242 (Gradall P/N 1440-3364) on screws when adding or removing shims.

Boom Chain

Check boom chain adjustment. With boom horizontal, extend boom 1.2m to 1.5m (4 to 5 feet), then fully retract boom. Measure gap between all bevel washers on extend chain rod, and add them together. If total of all gaps exceeds 3.04mm (.12 inch), boom chain will need to be adjusted. Adjust as follows:

A. Loosen lock nut on extend chain rod.
B. Tighten adjusting nut on extend chain rod until all washers are just flat (no gap between any washers).
C. Torque lock nut to 100 ft.-lb.

After adjusting, check that boom sections and / or access holes in side of boom are aligned. If they are not, retract chain will require adjustment as follows:

A. Fully retract boom.
B. Measure distance between 2nd and 3rd boom sections. Determine amount of misalignment.
C. Loosen extend chain lock nut and adjusting nut as far as possible.
D. Loosen retract chain lock nut and adjusting nut.
E. Tighten retract chain adjusting nut until proper distance between 2nd and 3rd boom sections and proper access hole alignment is obtained.
F. Torque lock nut to 100 ft.-lb.
G. Adjust extend chain per instructions above.

For more detailed information, including boom chain checks and adjustments, see the appropriate **Service Manual.**

INSPECTION AND MAINTENANCE LOG

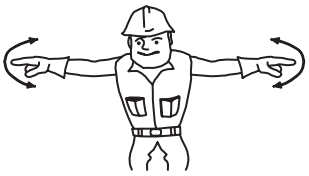
Date	Hourmeter Reading	Comments

HAND SIGNALS

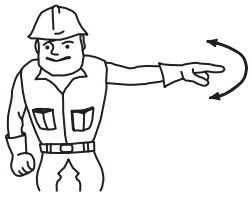
Standard Signals - When handler work conditions require hand signals, they shall be provided or posted conspicuously for the use of both signalman and operator. No handler motions shall be made unless signals are clearly understood by both signalman and operator.

Special Signals - When signals for auxiliary equipment functions or conditions not covered are required, they shall be agreed upon in advance by the operator and signalman.

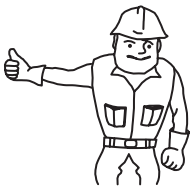
Instructions - When it is desired to give instructions to the operator other than provided by the established signal system, all handler motions shall first be stopped.



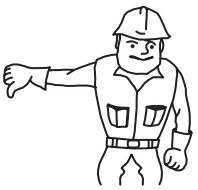
EMERGENCY STOP - With both arms extended laterally, hands open downward, move arms back and forth.



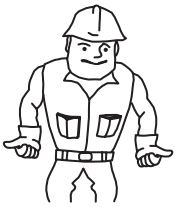
STOP - With either arm extended laterally, hand open downward, move arm back and forth.



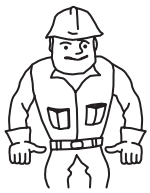
RAISE BOOM - With either arm extended horizontally, fingers closed, point thumb upward.



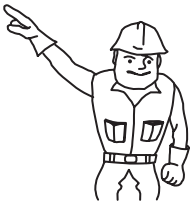
LOWER BOOM - With either arm extended horizontally, fingers closed, point thumb downward.



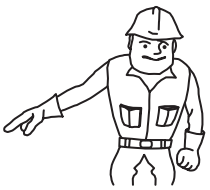
EXTEND TELESCOPIC BOOM - With both hands clenched, point thumbs outward.



RETRACT TELESCOPIC BOOM - With both hands clenched, point thumbs inward.



TILT FORKS UP - With one arm held at side, extend other arm upward at about 45°.



TILT FORKS DOWN - With one arm held at side, extend other arm downward at about 45°.

CLOSE BUCKET - Hold one hand closed and stationary. Rotate other hand in small vertical circle with forefinger pointing horizontally at closed hand.

OPEN BUCKET - Hold one hand open and stationary. Rotate other hand in small vertical circle with forefinger pointing horizontally at open hand.

MOVE SLOWLY - Place one hand motionless in front of hand giving motion signal. (Raise load slowly is shown)

THIS FAR TO GO - With hands raised and open inward, move hands laterally, indicating distance to go.

STOP ENGINE - Draw thumb or forefinger across throat.

CALIFORNIA

Proposition 65 Warning

Diesel engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects and other reproductive harm.

CALIFORNIA

Proposition 65 Warning

Battery posts, terminals and related accessories contain lead and lead compounds, chemicals known to the State of California to cause cancer and birth defects or other reproductive harm. Wash hands after handling.

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